Chris-Craft®

Owner's Manual

LANCER 20

LAUNCH 22, 25, 28

CORSAIR 25, 28

LANCER 22 RUMBLE

Chris-Craft®

Established 1874

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CHAPTER 1

Introduction

A Chris-Craft is a blend of the best of classic design, distinctive styling and superb naval engineering focused on producing truly seaworthy boats. Chris-Craft's dedication to craftsmanship and quality totally differentiates its boats from others and represents the company's enduring devotion to its proud past. America's best naval architects, designers, boat builders and furniture makers are committed to continuous new product development and technology and maintaining Chris-Craft as America's only premium boat brand, thus setting standards beyond perfection.

The Owner's Manual

This manual is written to meet the recommendations of ***Technical Information Report T-24, Owner's Manuals***, published by the American Boat and Yacht Council (ABYC) and the International Standard ***ISO 10240: Small Craft – Owner's Manual***.

In the United States, the American Boat and Yacht Council is a marine industry-based standards organization that publishes Standards and Recommended Practices for Small Craft. The book is an extensive collection of construction and design standards for small craft that is used as a guide by boat builders throughout the world. For more information contact:

American Boat & Yacht Council

3069 Solomon's Island Rd.
Edgewater, MD 21037-1416
Ph (410) 956-1050 Fax (410) 956-2737

This manual is compiled to aid in the operation of the Chris-Craft line of boats in a safe and enjoyable manner. It contains information on the systems, equipment operation, and general maintenance on each model of boat. Many of the systems in the Chris-Craft line are similar among the various models, where differences do occur, they will be pointed out and explained.

This manual provides up-to-date information on various systems at the time this vessel was manufactured. Specifications of engines and other components are all subject to change without notice. The data contained herein is subservient to the manufacturers' manuals of the numerous components, installed in this vessel. If a discrepancy exists between this manual and the component manual, the component manual takes precedence.

This owner's manual is not a course on boating safety or seamanship. If this is your first craft, or if you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before assuming command of the craft.

Always use trained and competent people for maintenance, repair, or modifications. The boat builder cannot be held responsible for modifications he has not approved.

Any craft, no matter how strong it may be, can be severely damaged if not used properly. This is not compatible with safe boating. Always adjust the speed and direction of the craft to the sea conditions. Ensure that the anticipated wind and sea conditions corresponds to the design category of your craft, and that you and your crew are able to handle the craft in these conditions.

All persons should wear suitable buoyancy aid (life jacket/personal flotation device) when operating your boat.

It is incumbent upon the owner/operator to stay informed of any changes and/or modifications that affect any component of this vessel and/or the safety of the vessel.

KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT.

Chris-Craft boats are proudly manufactured in the United States of America by the Chris-Craft Corporation.

Chris-Craft Corporation

8161 15th Street East
Sarasota, FL 34243
Phone: (941) 351-4900
Fax: (941) 358-3776

What This Manual Covers

NOTICE

The features and specifications discussed in this manual are subject to change without notice. Chris-Craft reserves the right to discontinue any model and make changes, at any time, in colors, equipment, specifications, materials, and prices. Chris-Craft is not obligated to make, or provide, similar changes to any model previously sold.

This manual covers the following Chris-Craft models:

- Lancer 20
- Launch 22, 25, and 28
- Lancer 22 Rumble
- Corsair 25 and 28

Each of these models share common components which are discussed in this manual. If significant differences occur between models these differences are discussed.

Each model offers various upgrades and options. When you take possession of your Chris-Craft you receive the appropriate manuals associated with options you may have chosen, consequently options and upgrades are not discussed in this manual.

As the owner/operator it is your responsibility to familiarize yourself with the specific characteristics of your boat.

General Specifications

Performance

Performance is based upon the type of options you selected for your Chris-Craft. When you take possession of your boat you receive the appropriate books for your boat. As the owner/operator it is your responsibility to familiarize yourself with the performance specifications and maintenance requirements of your engine.

Table 1-1. General Specifications

Model	Lancer 20	Launch 22	Launch 25	Launch 28	Lancer 22 Rumble	Corsair 25	Corsair 28
Overall Length	20’ 2”	23’ 5”	27’ 2”	28’ 0”	23” 5”	25’ 4”	28’ 0”
Beam	7’ 11”	8’ 3”	8’ 6”	10’ 0”	8’ 3”	8’ 6”	10’ 0”
Dry Weight	2,850 lbs	4,019 lbs	5,105 lbs	7,500 lbs	4,019 lbs	4,600 lbs	7,500 lbs
Deadrise	20 deg	20 deg	20 deg	20 deg	20 deg	20 deg	20 deg
Draft	34/17.5”	35.75/19”	36.5/20”	See Note 1	35.75/19”	35/17”	See Note 2
Fuel Capacity	34 gal	58 gal	85 gal	150 gal	58 gal	82 gal	150 gal
Water Capacity	N/A	9 gal	9 gal	35 gal	9 gal	9 gal	35 gal

Notes:

1. Twin Engine Draft: 33.5/20”
   Singe Engine Draft: 35/17”
2. Twin Engine Draft: 33.5/20”
   Singe Engine Draft: 35/17”

Table 1-2. Maximum Persons Capacities

Model	Lancer 20	Launch 22	Launch 25	Launch 28	Lancer 22 Rumble	Corsair 25	Corsair 28
U.S. Standard	5	8	10	N/A	8	10	N/A
CE Standard	5	7	9	10	7	9	10

Table 1-3. Bridge Clearances

Model	Lancer 20	Launch 22	Launch 25	Launch 28	Lancer 22 Rumble	Corsair 25	Corsair 28
U.S. Standard	3’ 7”	3’ 9”	4’ 5”	4’ 6”	3’ 9”	4’ 1½”	4’ 6”
Metric	1.092m	1.124m	1.340m	1.390m	1.124m	1.26m	1.390m

Engine Performance

Engine performance is based upon the type of engine option you selected for your Chris-Craft. When you take possession of your boat you receive the appropriate engine books for your boat. As the owner/operator it is your responsibility to familiarize yourself with the performance specifications and maintenance requirements of your engine.

Weight Conversions

Weight and loading attributes are important for safe boating. Use the following table to approximate the weights of liquids carried aboard the boat.

Table 1-4. Weight Conversions

Item	For Pounds per Gallon Multiply Number of Gallons by:	For Kilograms Multiply Pounds by:
Gasoline	6.1	0.4536
#2 Diesel Fuel	7.05	0.4536
Potable Water	8.33	0.4536

1 gallon of gasoline = 6.1 pounds

1 gallon of #2 Diesel Fuel = 7.05 pounds

1 gallon Potable Water = 8.33 pounds

1 pound = 0.4536 kilograms

Design Category

Every boat built, regardless of manufacturer, falls within a specific design category applicable to that model. Currently there are four (4) categories designated by the ISO 10240 Standard. They are:

- Category A – Ocean: Craft designed to operate in winds that may exceed wind force 8* (34-40 knots/39-46 mph) and in significant wave heights of 4 meters (13 feet) and above. These vessels are largely self-sufficient. Abnormal conditions such as hurricanes are excluded. Such conditions may be encountered on extended voyages, such as ocean crossings or inshore when unsheltered from the wind and waves for several hundred nautical miles.
- Category B – Offshore: Craft designed to operate in winds up to, and including, wind force 8* (34-40 knots/39-46 mph) and in significant wave heights up to, and including, 4 meters (13 feet). Such conditions may be encountered on offshore voyages of sufficient length or on coastal waters when unsheltered from the wind and waves for several dozens of nautical miles. These conditions may also be experienced on inland seas of sufficient size for the wave height to be generated.
- Category C: Craft designed to operate in winds up to, and including, wind force 6* (22-27 knots/25-31 mph) and in wave heights up to, and including, 2 meters (7 feet). Such conditions may be encountered in exposed inland waters, in estuaries, and in coastal waters in moderate weather conditions.
- Category D: Craft designed to operate in winds up to, and including, wind force 4* (11-16 knots/13-18 mph) and in wave heights up to, and including, 0.3 meters (1 foot) with occasional waves of 0.5 meters (2 feet) maximum height. Such conditions may be encountered in sheltered inland waters and in coastal waters in fine weather.

  * Wind force is based upon the Beaufort Scale.

  For categories A, B, and C, the significant wave height is the average height of the highest one-third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will double this height.

The boats addressed in this manual are certified as follows:

BOAT	CATAGORY
Lancer 20/Launch 22/Launch 25/Lancer Rumble	C
Launch 28	B
Corsair 25 and 28	B

Component Manufacturers

Chris-Craft uses numerous vendors in the manufacturer of their boats. Each major component comes with an owner's or operation manual which provides information on component operation, troubleshooting and warnings.

Table 1-5 contains a list of vendors that provide components for Chris-Craft.

Table 1-5. Vendor Directory

Battery Charger	**Professional Mariner, LLC** PO Box 968 Rye, NH 03870 Phone: (603) 433-4440 Fax: (603) 433-4442 **www.pmariner.com**	**Engines**	**Mercury Marine** W6250 W. Pioneer Road P.O. Box 1939 Fond du Lac, WI 54936-1939 Phone: (Phone: (920) 929-5040 Fax: (Fax: (920) 929-5893 **www.mercurymarine.com**
Bilge Pumps	**Rule Industries** Cape Ann Industrial Park Gloucester, MA 01930 Phone: (978) 281-0440 Fax: (978) 283-2619 **www.rule-industries.com**		**Volvo Penta of the Americas, Inc.** 1300 Volvo Penta Drive Chesapeake, VA 23320-9860 Phone: (Phone: (757) 436-2800 Fax: (Fax: (757) 436-5150 **www.volvo.com**
Canvas	**Ameritex Technologies** 2111 58th Avenue East Bradenton, FL 34203 Phone: (941) 751-6131 Fax: (941) 751-0791 **www.ameritex-tech.com**	**Engine Blowers**	**SHURflo, LLC** 5900 Katella Ave. Cypress, CA 90630 Phone: (562) 795-5200 Phone: (800) 854-3218 Fax: (562) 795-7564 **www.shurflo.com**
Electric/Hydraulic Hatch Ram	**Uflex USA Inc.** 6442 Parkland Drive Sarasota, FL 34243 Phone: (941) 351-2628 Fax: (941) 360-9171 **www.uflexusa.com**	**Gauges**	**Faria Marine Instruments** P.O. Box 983 Uncasville, CT 06382-0983 Phone: (860) 848-9271 Fax: (860) 848-2704 **www.faria-instruments.com**
Electronic Equipment	**Raymarine** Contact information is based upon dealer and region. Visit website for contact information. Phone: (603) 881-5200 Fax: (603) 864-4756 **www.raymarine.com**	**Gelcoat**	**HK Research Corp.** P.O. Box 1809 Hickory, NC 28603 Phone: (800) 334-5975 Fax: (828) 328-1721 **www.hkresearch.com**

Table 1-5. Vendor Directory (Continued)

Hoses	**Marine Products International** 29603 Hall St. Solon, OH 44139 Phone: (440) 519-1750 Toll Free: (800) 845-5255 Fax: (440) 519-1754 **www.marinehose.com**	**Throttle/Shift Control and Cables**	**Uflex USA Inc.** 6422 Parkland Drive Sarasota, FL 34243 Phone: (941) 351-2628 Fax: (941) 360-9171 **www.uflexusa.com**
Refrigerator/Cooling Unit	**Indel Marine USA Inc.** 3400 Gateway Drive, Unit #107 Pompano Beach, FL 33069 Phone: (945) 984-8448 Fax: (954) 979-2533 **www.indelmarine.com**	**Trim Tabs**	**Bennett Marine** 550 Jim Moran Blvd. Deerfield Beach, FL 33442 Phone: (954) 427-1400 Fax: (954) 480-2897 **www.bennetttrimtabs.com**
Steering Helm Assembly	**Teleflex Marine** 1 Sierra Place Litchfield, IL 62056-3029 **www.teleflexmarine.com**	**Water Pump**	**SHURflo, LLC** 5900 Katella Ave. Cypress, CA 90630 Phone: (562) 795-5200 Phone: (800) 854-3218 Fax: (562) 795-7564 **www.shurflo.com**
Stereo Components	**Tristar Distributing** 58263 Charlotte Ave Elkhart, IN 46515 Phone: (574)294-2684 **www.tristardistributing.com**	**Windshield**	**Ameritex Technologies** 2111 58th Avenue East Bradenton, FL 34203 Phone: (941) 751-6131 Fax: (941) 751-0791 **www.ameritex-tech.com** (For additional contact numbers, see the Ameritex website.) For: Lancer 20, LAUNCH 22, and LANCER 22 RUMBLE)
Teak (Cockpits, Swim Platforms, and Deck Rails)	**Teak Decking Systems** 7061 15th Street East Sarasota, FL 34243 Phone: (941) 756-0600 Fax: (941) 756-0406 **www.teakdecking.com**		**Taylor Made Systems New York** 93 South Boulevard Gloversville, NY 12078 Phone: (518) 773-0636 Fax: (518) 773-2919 **www.taylormarine.com** (For additional contact numbers and plant addresses, see the Taylormarine website.) (For: LAUNCH 25, LAUNCH 28, and CORSAIR 28)

CHAPTER 2

Safety and Operations

As the owner/operator of your Chris-Craft, it is your responsibility to be safety conscious at all times. This includes, but is not limited to:

- Know and understand the limitations of both yourself and your vessel.
- Understand and follow the "**rules of the road.**"
- Understand the potential hazards of boating.
- Deliberately stay out of weather conditions that exceed the operator's capability.
- Keeping your passenger's safety in mind at all times.
- Operate the vessel in a proper manner when encountering limited visibility, rough water, and other weather or people induced factors.
- Understanding how to administer first aid, including CPR.
- Know how to treat hypothermia.
- Be ready for emergencies.

This chapter addresses numerous safety and responsibility topics which you need to be familiar with. It is not all-inclusive, but rather provides a starting point for your boating knowledge.

There are numerous WARNINGS, CAUTIONS, and NOTICES presented in this manual and the manufacturers' supplied literature.

As the owner/operator, it is your responsibility to replace any label that becomes illegible. Replacement labels may be obtained from Chris-Craft.

The safety signs and warnings in this manual conform to ***American Boat & Yacht Council Standard T-5, Safety Signs and Labels***. Each of the labels are illustrated below with an explanation of the hazard level.

This manual is not all inclusive, and does not constitute all of the Warnings, Cautions, and Notices that should be recognized and practiced. This manual does not incorporate all the safety practices you should use in boating.

Immediate hazards that WILL result in severe personal injury or death if the warning is ignored.

Hazards or unsafe practices that COULD result in severe personal injury or death if the warning is ignored.

Hazards or unsafe practices that could result in injury, product, or property damage if the warning is ignored.

Notice is used to notify people of installation, operation, or maintenance information, which is important, but not hazard related.

The following symbols are used in conjunction with the Warning statements to indicate a hazardous condition exists and that precautions must be followed to prevent injury or death.

Explosion

The rapidly expanding symbol shows that the material may explode if subjected to high temperature, sources of ignition, or high pressure.

Chemical or Hot Water Hazard

The symbol represents a hazard to skin. The appropriate type of gloves shall be worn to protect skin.

Eye Protection

The symbol of a person wearing goggles indicates that the material will injure the eyes.

Fire

The fire symbol indicates that the material may ignite and cause burns.

Poison

The skull and crossbones symbol indicates the material is poisonous or a danger to life.

Vapor

The symbol of a human figure in a cloud shows that material vapors present a danger to life or health.

Warning Placards and Labels

Each model of boat has warning placards and labels that you must become familiar with. These warnings indicate a condition that, if not followed, may result in injury and/or damage to the boat.

If a warning placard/label becomes unreadable, Federal Law dictates that it must be replaced with a new one. To obtain a replacement warning placard, contact Chris-Craft directly.

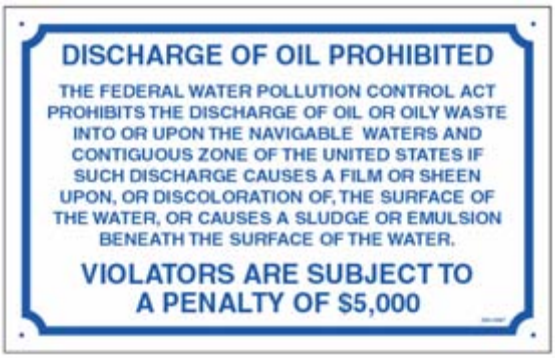

DISCHARGE OF OIL PROHIBITED
THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS AND CONTIGUOUS ZONE OF THE UNITED STATES IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON, OR DISCOLORATION OF, THE SURFACE OF THE WATER, OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER.
VIOLATORS ARE SUBJECT TO A PENALTY OF $5,000

Figure 2-1. Placard – Discharge of Oil

Figure 2-2. Label – Unleaded Fuel Only

Figure 2-3. Label – Rumble Seat Hatch Cover

WARNING
To minimize shock and fire hazards:
(1) Turn off the boat's shore connection switch before connecting or disconnecting shore cable.
(2) Connect shore power cable at the boat first.
(3) If polarity warning indicator is activated, immediately disconnect cable.
(4) Disconnect shore power cable at shore outlet first.
(5) Close shore power inlet cover tightly.
DO NOT ALTER SHORE POWER CONNECTORS

Figure 2-4. Label – Shock Hazards

Figure 2-5. Label – Electric Hatch

CAUTION
To avoid misuse and possible injury:
1. In case of fire, do not open engine box (compartment)
2. Shut down engines, generators and blowers
3. Continuously discharge entire contents of portable fire extinguisher through the port (or other provision) immediately.
4. Remove cushion to access fire port.

Figure 2-6. Label – Fire

Figure 2-7. Label – Trim Tab

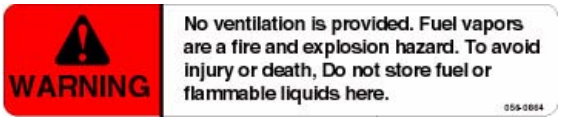

WARNING
No ventilation is provided. Fuel vapors are a fire and explosion hazard. To avoid injury or death, Do not store fuel or flammable liquids here.

Figure 2-8. Label – Fuel Vapors

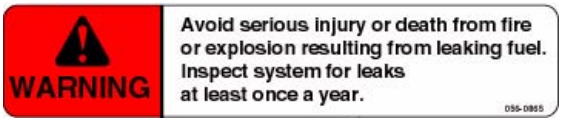

WARNING
Avoid serious injury or death from fire or explosion resulting from leaking fuel. Inspect system for leaks at least once a year.

Figure 2-9. Label – Leaking Fuel

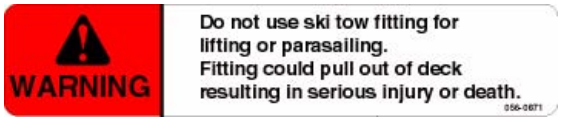

WARNING
Do not use ski tow fitting for lifting or parasailing. Fitting could pull out of deck resulting in serious injury or death.

Figure 2-10. Label – Ski Tow Fitting

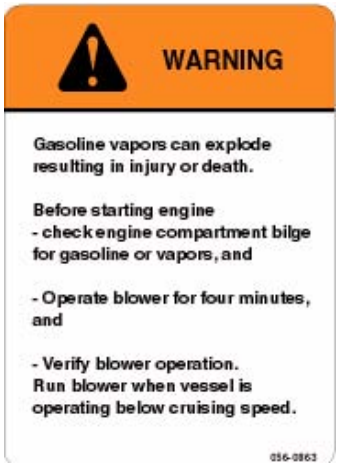

WARNING
Gasoline vapors can explode resulting in injury or death.
Before starting engine
- check engine compartment bilge for gasoline or vapors, and
- Operate blower for four minutes, and
- Verify blower operation. Run blower when vessel is operating below cruising speed.

Figure 2-11. Label – Gasoline Vapors

WARNING
BEFORE STARTING ENGINE
EQUIPMENT
DRAIN PLUG - Secured?
MOVEABLE SEATS - Secured?
LIFE JACKET - one for each person?
OTHER EMERGENCY GEAR - on board?
PROCEDURES
EMERGENCY STOP SWITCH - tether hooked up?
EVERYBODY - seated in boat? NEVER on seatbacks, or edges of boat!
OPERATOR'S VISION - unobstructed?
WEATHER CONDITIONS - safe to go out?
PASSENGERS - aware of EMERGENCY procedures?

Figure 2-12. Label – Before Engine Start

DANGER
Never approach or use ladder when motor is running. Severe injury or death will result from contact with rotating propeller.

Figure 2-13. Label – Propeller Danger

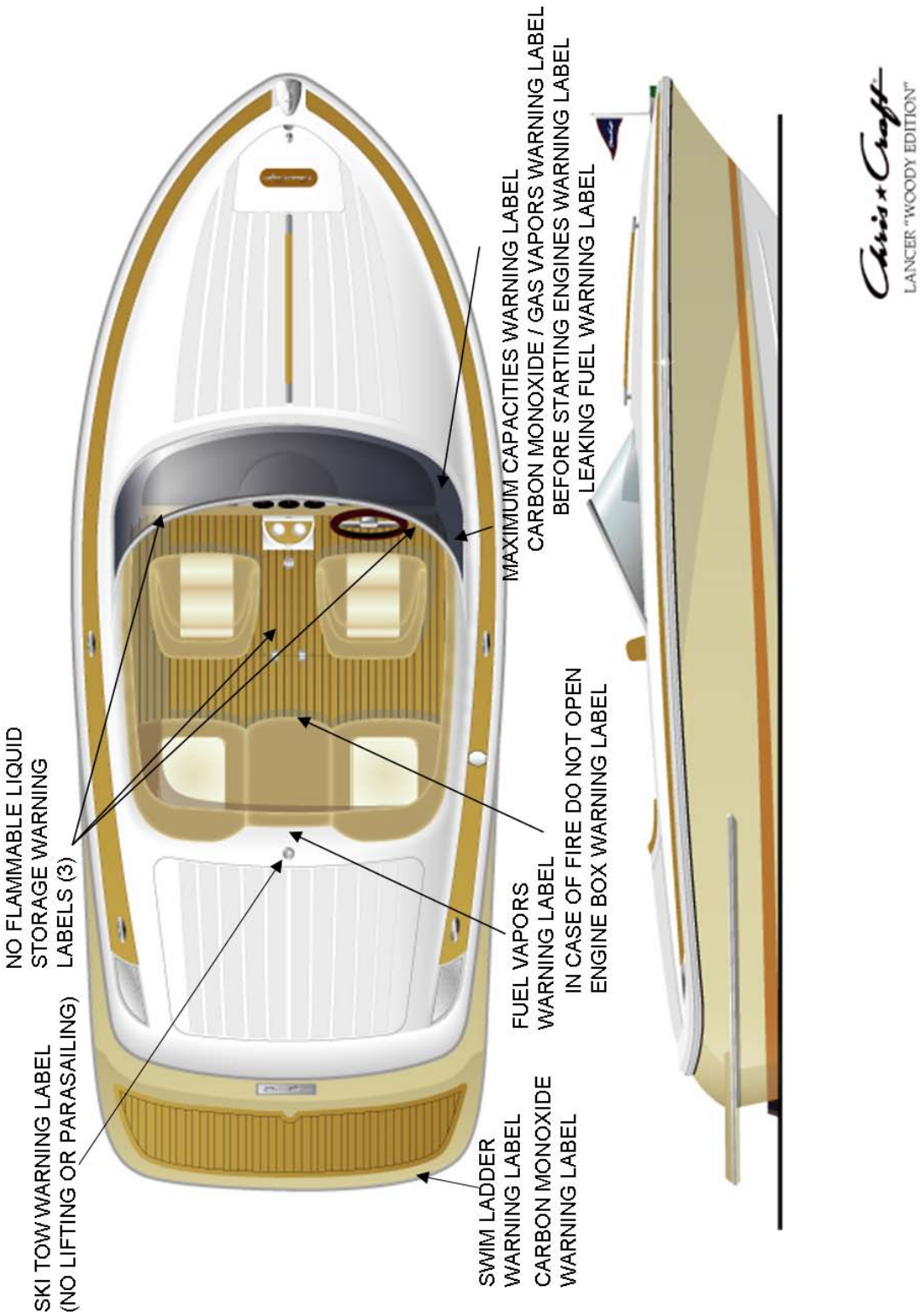


Figure 2-14. Warning Labels – Lancer 20

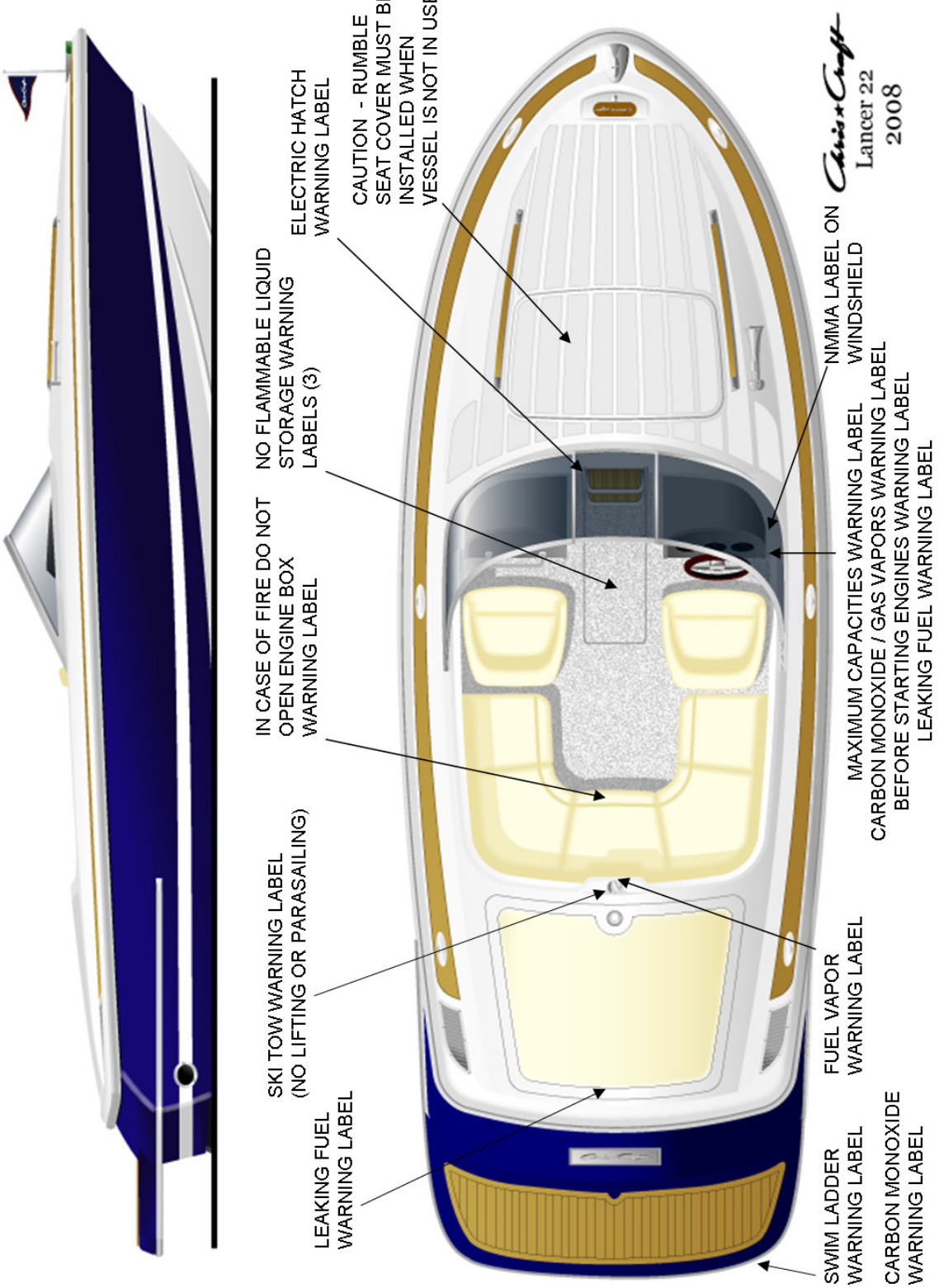

ELECTRIC HATCH WARNING LABEL
CAUTION - RUMBLE SEAT COVER MUST BE INSTALLED WHEN VESSEL IS NOT IN USE
NO FLAMMABLE LIQUID STORAGE WARNING LABELS (3)
IN CASE OF FIRE DO NOT OPEN ENGINE BOX WARNING LABEL
SKI TOW WARNING LABEL (NO LIFTING OR PARASAILING)
LEAKING FUEL WARNING LABEL
SWIM LADDER WARNING LABEL
CARBON MONOXIDE WARNING LABEL
FUEL VAPOR WARNING LABEL
NMMA LABEL ON WINDSHIELD
MAXIMUM CAPACITIES WARNING LABEL
CARBON MONOXIDE / GAS VAPORS WARNING LABEL
BEFORE STARTING ENGINES WARNING LABEL
LEAKING FUEL WARNING LABEL
Chris-Craft
Lancer 22
2008

Figure 2-15. Warning Labels – Lancer 22 Rumble

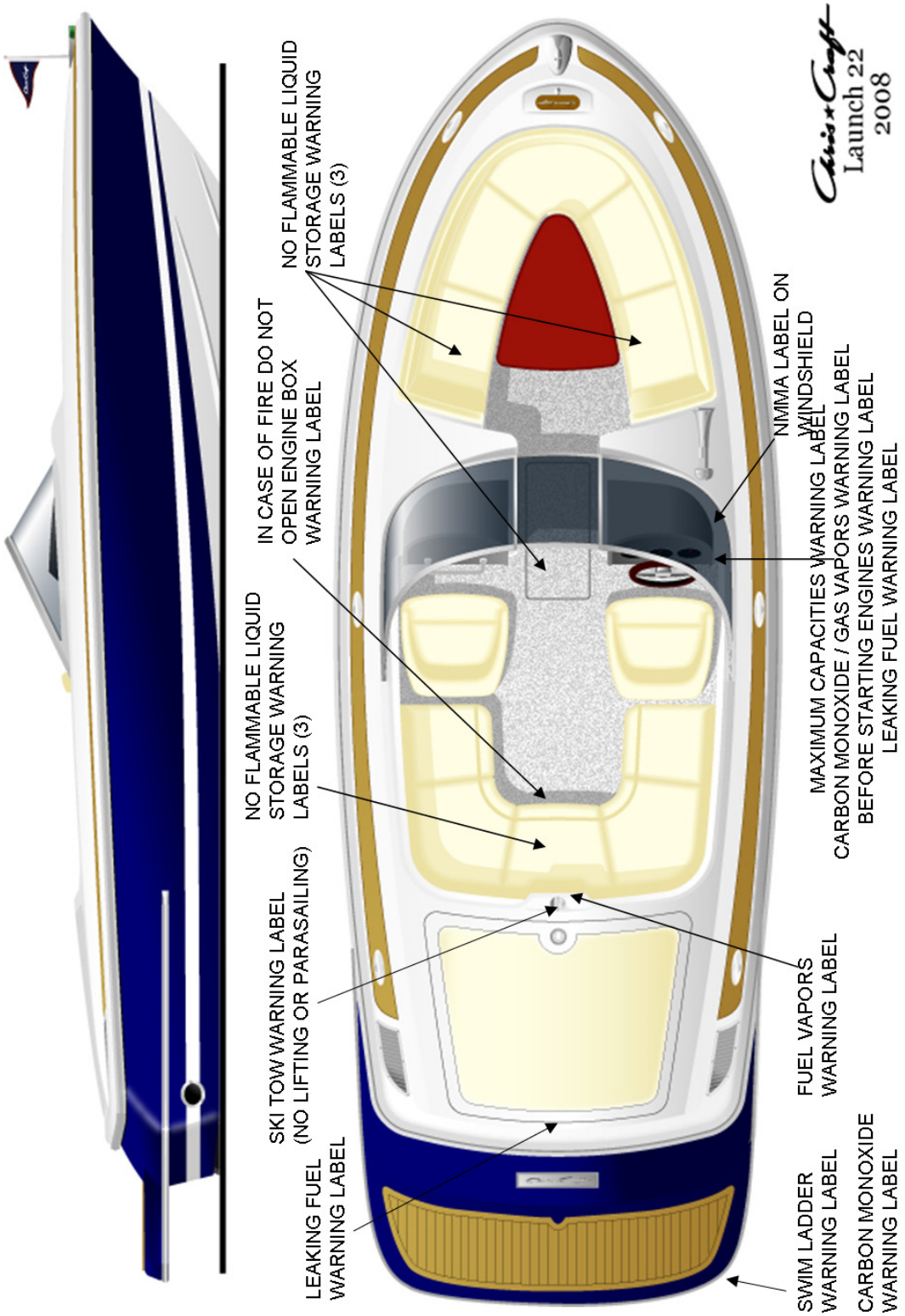

NO FLAMMABLE LIQUID STORAGE WARNING LABELS (3)
IN CASE OF FIRE DO NOT OPEN ENGINE BOX WARNING LABEL
NO FLAMMABLE LIQUID STORAGE WARNING LABELS (3)
SKI TOW WARNING LABEL (NO LIFTING OR PARASAILING)
LEAKING FUEL WARNING LABEL
NMMA LABEL ON WINDSHIELD
MAXIMUM CAPACITIES WARNING LABEL
CARBON MONOXIDE / GAS VAPORS WARNING LABEL
BEFORE STARTING ENGINES WARNING LABEL
LEAKING FUEL WARNING LABEL
FUEL VAPORS WARNING LABEL
SWIM LADDER WARNING LABEL
CARBON MONOXIDE WARNING LABEL
Chris-Craft
Launch 22
2008

Figure 2-16. Warning Labels – Launch 22

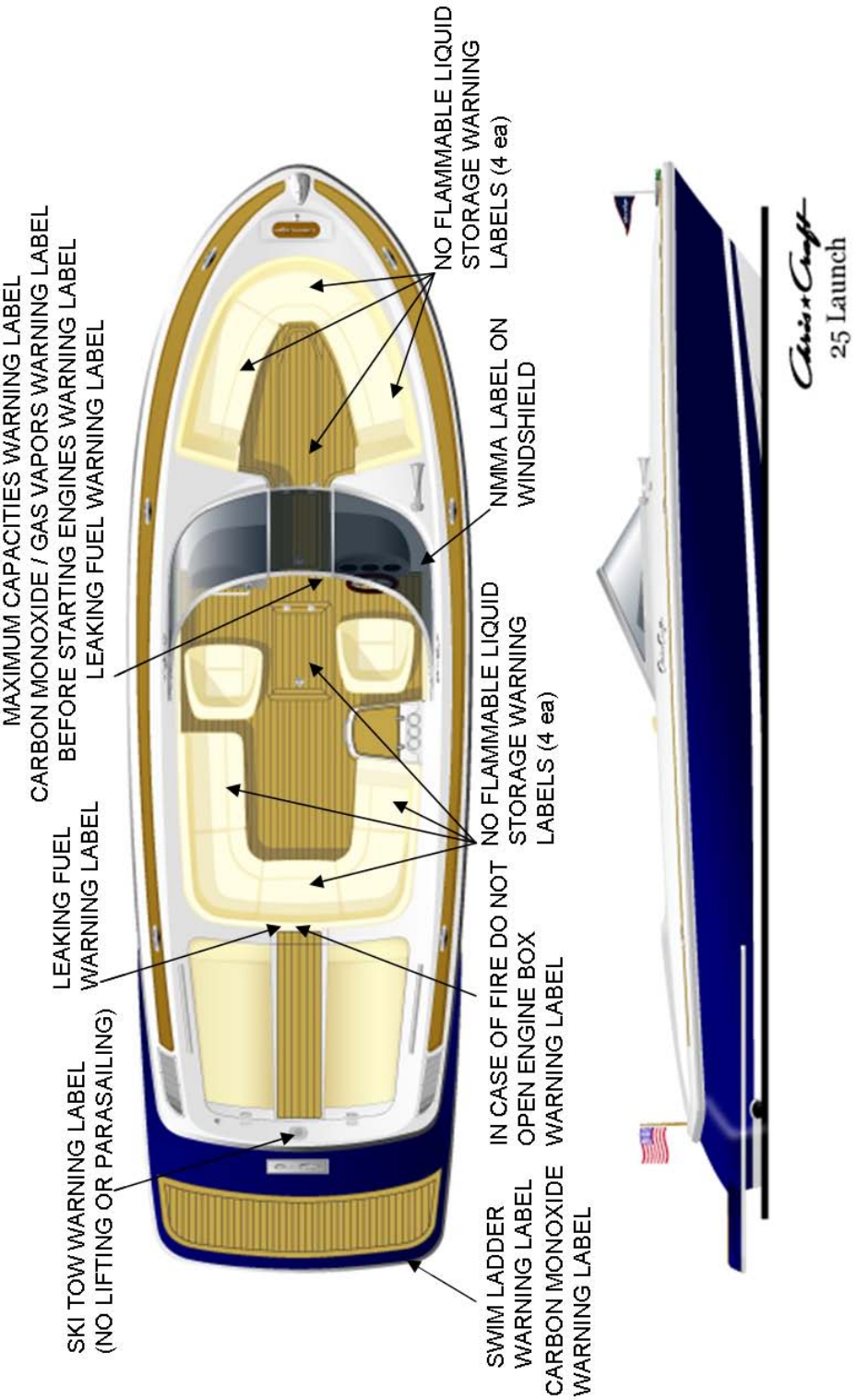

MAXIMUM CAPACITIES WARNING LABEL
CARBON MONOXIDE / GAS VAPORS WARNING LABEL
BEFORE STARTING ENGINES WARNING LABEL
LEAKING FUEL WARNING LABEL
NO FLAMMABLE LIQUID STORAGE WARNING LABELS (4 ea)
NMMA LABEL ON WINDSHIELD
LEAKING FUEL WARNING LABEL
NO FLAMMABLE LIQUID STORAGE WARNING LABELS (4 ea)
SKI TOW WARNING LABEL (NO LIFTING OR PARASAILING)
IN CASE OF FIRE DO NOT OPEN ENGINE BOX WARNING LABEL
SWIM LADDER WARNING LABEL
CARBON MONOXIDE WARNING LABEL
Chris-Craft
25 Launch

Figure 2-17. Warning Labels – Launch 25

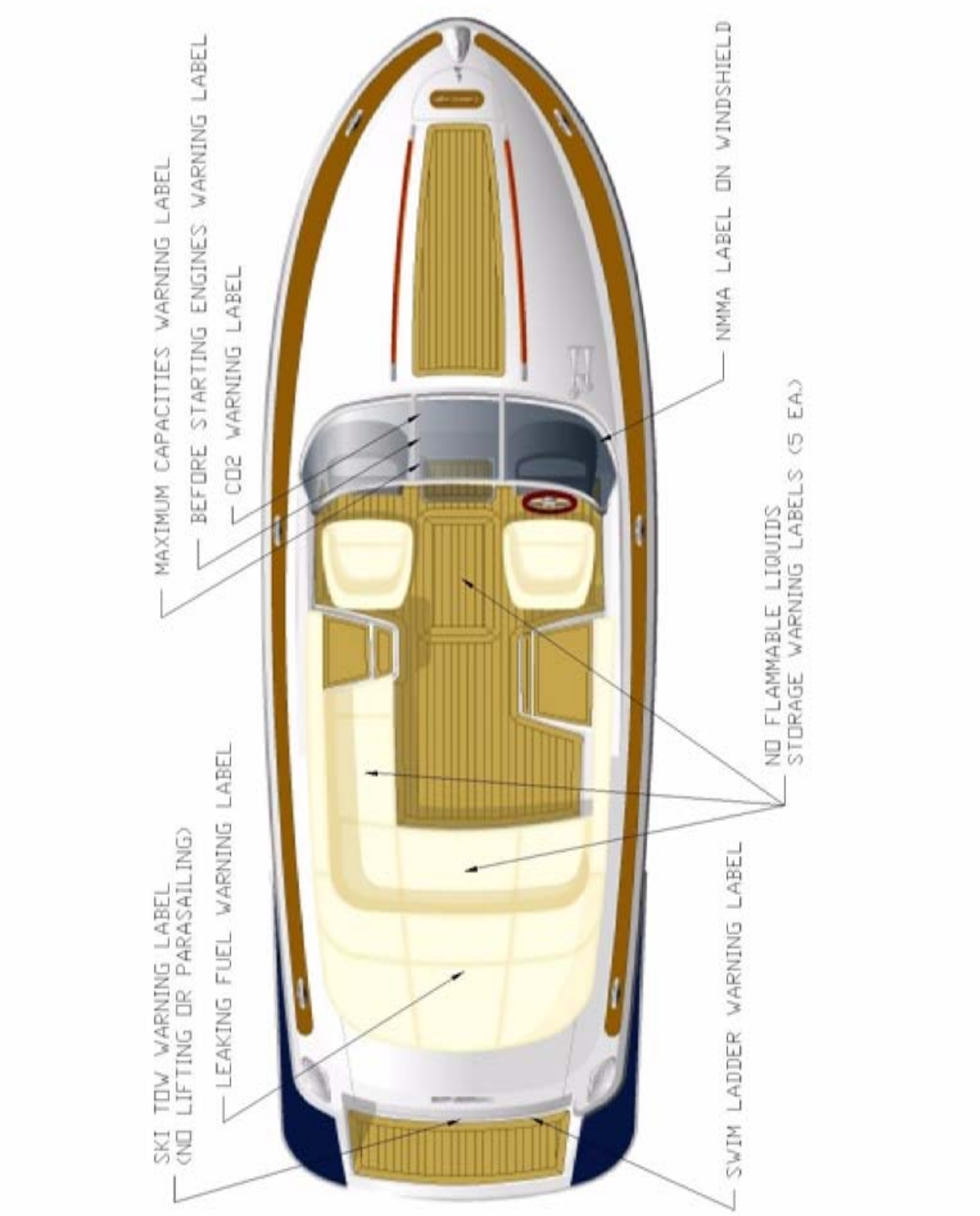

MAXIMUM CAPACITIES WARNING LABEL
BEFORE STARTING ENGINES WARNING LABEL
CO2 WARNING LABEL
NMMA LABEL ON WINDSHIELD
NO FLAMMABLE LIQUIDS
STORAGE WARNING LABELS (5 EA.)
SKI TOW WARNING LABEL
(NO LIFTING OR PARASAILING)
LEAKING FUEL WARNING LABEL
SWIM LADDER WARNING LABEL

Figure 2-18. Warning Labels – Corsair 25

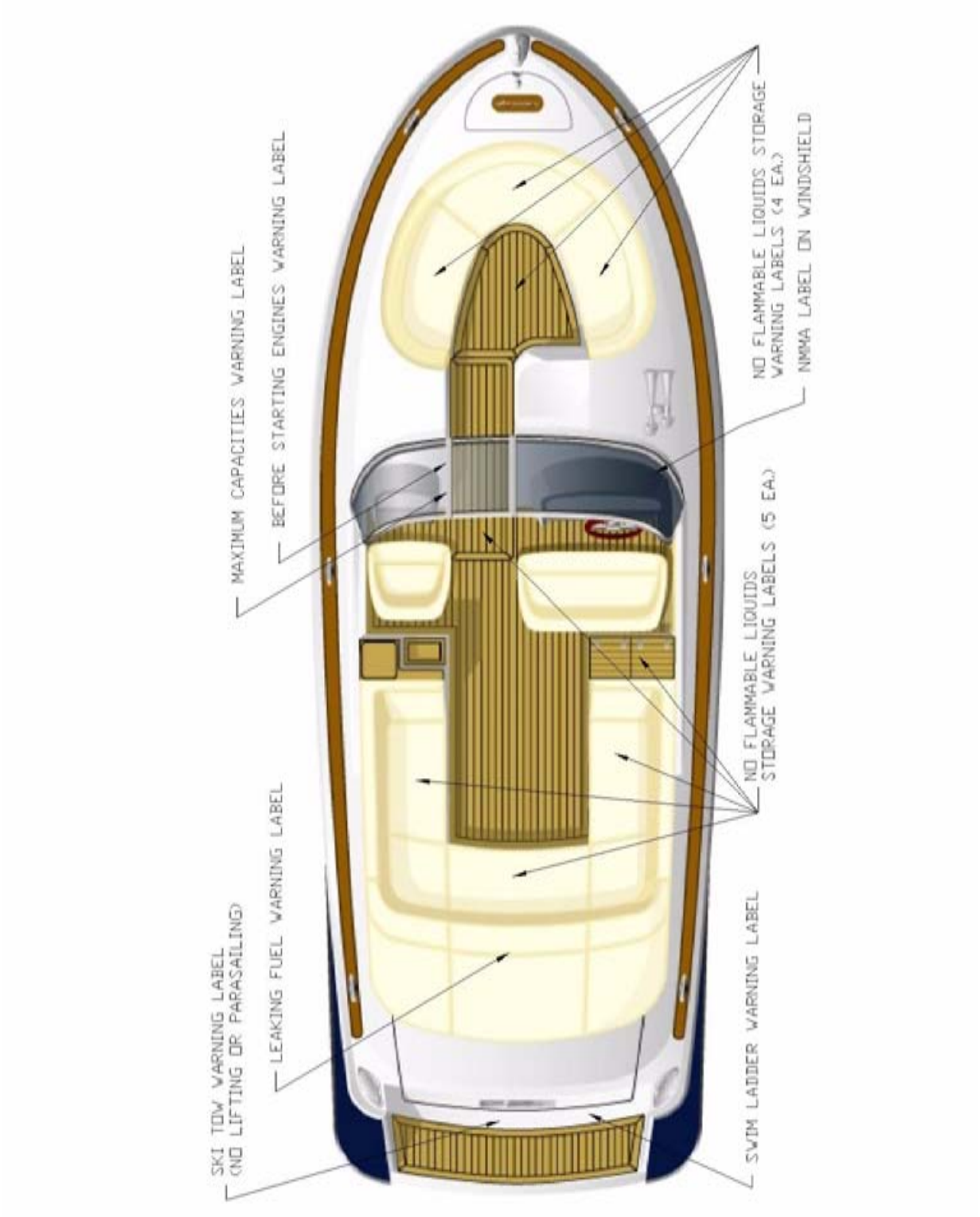

MAXIMUM CAPACITIES WARNING LABEL
BEFORE STARTING ENGINES WARNING LABEL
NO FLAMMABLE LIQUIDS STORAGE
WARNING LABELS (4 EA.)
NMMA LABEL ON WINDSHIELD
NO FLAMMABLE LIQUIDS
STORAGE WARNING LABELS (5 EA.)
LEAKING FUEL WARNING LABEL
SKI TOW WARNING LABEL
(NO LIFTING OR PARASAILING)
SWIM LADDER WARNING LABEL

Figure 2-19. Warning Labels – Launch 28

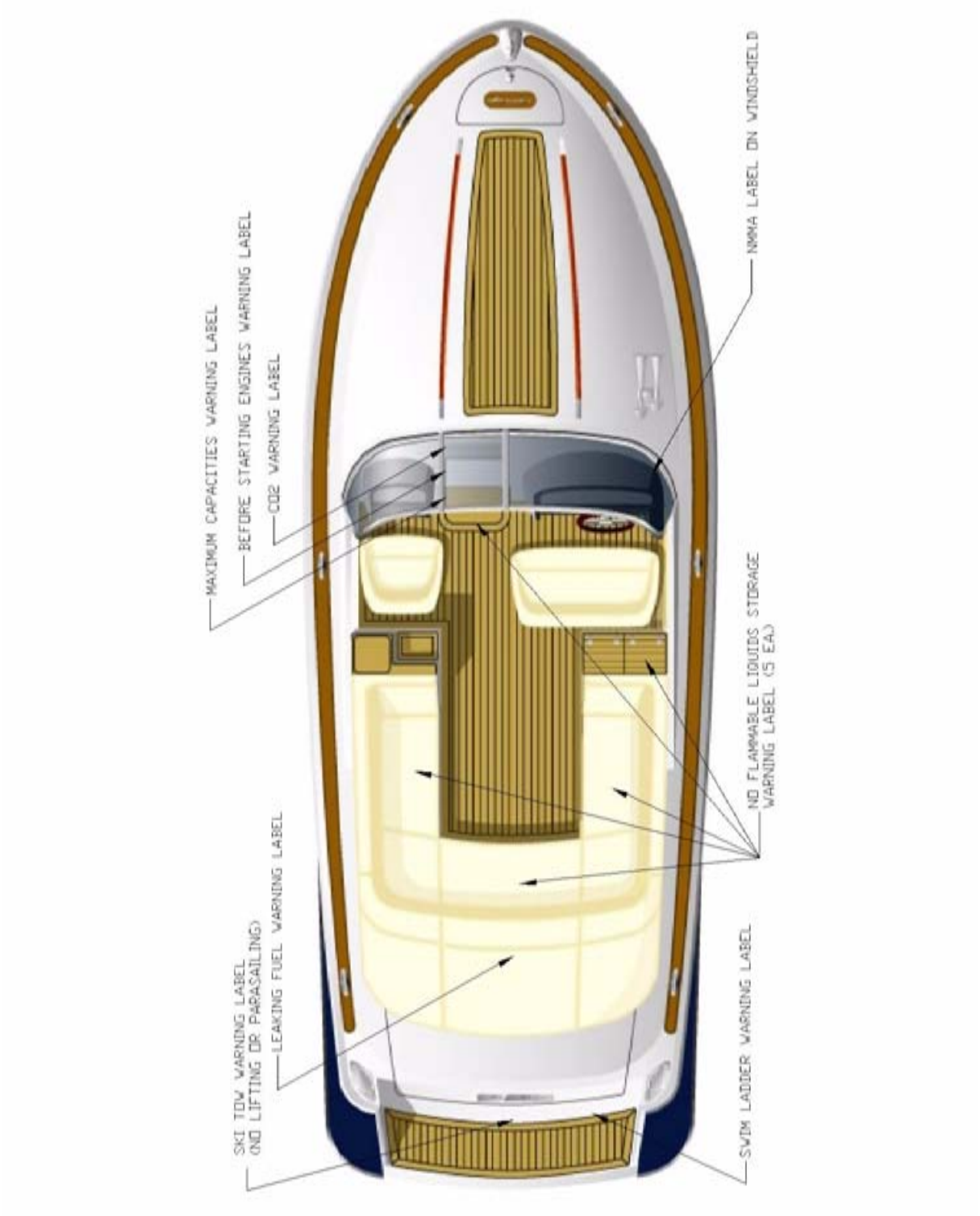

MAXIMUM CAPACITIES WARNING LABEL
BEFORE STARTING ENGINES WARNING LABEL
CO2 WARNING LABEL
NMMA LABEL ON WINDSHIELD
NO FLAMMABLE LIQUIDS STORAGE
WARNING LABEL (5 EA.)
SKI TOW WARNING LABEL
AND LIFTING OR PARASAILING)
LEAKING FUEL WARNING LABEL
SWIM LADDER WARNING LABEL

Figure 2-20. Warning Labels – Corsair 28

Boating Safety

Operating your Chris-Craft without proper experience and/or without full understanding of the boat and its systems can cause serious injury. The owner/operator must read and understand this manual and the manufacturers' manuals supplied with it before operating the vessel. Do not operate the boat if existing or anticipated conditions are beyond your level of experience.

Boating safety cannot be overemphasized. Understand the rules of the road and operate your vessel in a safe manner. Understand the potential hazards of boating. Be prepared for emergencies.

For additional information contact the United States Power Squadron and the United States Coast Guard Auxiliary at:

United States Coast Guard Auxiliary Flotilla

800-336-BOAT(2628)

As the owner/operator, it is your responsibility to become completely familiar with the Chris-Craft before operating the vessel. Read and understand this manual and various manufacturers' manuals accompanying this manual.

If you have any questions regarding your Chris-Craft or the factory installed equipment, contact your dealer or Chris-Craft at (941) 351-4900.

General Safety Precautions

Boating is a great recreation activity. However, emergencies on the water do happen and as the owner/operator it is your responsibility to be prepared for them.

This safety list is general in nature and not all-inclusive. Common sense is always the best route to follow when boating.

- Mechanical safety.
  - When working around operating machinery, such as the engines, always wear hearing protection. Eye protection is always a good idea.
  - Understand operating machinery becomes hot. Wear proper protection such as gloves.
  - Take all proper precautions when working around moving parts. Wear tight fitting clothes as loose clothing may get caught in moving parts.
  - Beware of toxic gases. What you don't see and/or smell can kill you.
  - Understand all the safety precautions associated with mechanical maintenance.
- Know the limits.
  - Understand your own limits.
  - Understand the limits of your boat. Don't overload the vessel. Distribute weight evenly.
  - Follow your checklists to ensure you don't miss an important item.
- If you don't know how, learn to swim. Many Red Cross chapters offer swim courses that you can take advantage of.
- Keep the boat free of oil and grease. A fall on a slippery deck or ladder can have very serious consequences.
- When cruising, monitor the weather. Weather at sea can change rapidly. Be prepared.
- Be ready for emergencies. This chapter is a good starting point for understanding how to handle common emergencies.
- Carry the proper safety equipment. Carry a set of tools for emergency repairs. Keep extra batteries for flashlights and other battery-operated equipment.

Best Defense – Common Sense.

Boating Courses

Operating a boat requires a greater skill than operating a car or truck. To enjoy a pleasurable and safe boating experience you must acquire these skills. Some recommendations are:

- Take a Coast Guard, United States Power Squadron boating safety course. For information call: 800-336-BOAT (2628), or
- Take a boating safety course offered by local colleges or boating clubs.
- Obtain “hands-on” training from qualified personnel on how to operate your vessel.

Boating courses help you to gain knowledge and experience in such areas as, but is not limited to: navigation, seamanship, rules of the road, weather, safety at sea, survival, first aid, communications, and pollution control.

Basic Seamanship

As the owner/operator it is your responsibility to learn the “rules-of-the-road” and understand basic seamanship rules and standards, as only rudimentary information is repeated here.

In practical terms boats that are less maneuverable have the right-of-way over more agile vessels. In general a power-driven vessel must give way to the following:

- A sailing vessel under sail only (engine(s) not running).
  - When the sailboat is under engine power, it is considered a power-driven vessel.
- Vessels propelled by oars or paddles.
- A commercial fishing vessel engaged in fishing.
  - This does not apply to sportfishers or party boats.
- Vessels with restricted maneuverability, such as:
  - Tow boats.
  - A vessel engaged in dredging activities or work that restricts it to a specific area.
  - A vessel engaged in the transfer of supplies from one vessel to another.
- A vessel not under command, broken down.

Meeting Situations

When meeting in various situations the give-way vessel must take action to avoid a collision and maintain a safe distance. The stand-on vessel should maintain course and speed.

If it becomes apparent that a collision is possible and the give-way vessel is not taking corrective action, it is your responsibility to take action and avoid a collision.

Meeting Head-On

When two boats meet head-on neither boat has the right-of-way. Both boats should reduce speed and pass port-to-port (Figure 2-21).

Figure 2-21. Passing Port-to-Port

If it is not possible to pass port-to-port due to some obstruction or other boat traffic, you should sound two short blasts to indicate that you are intending to pass starboard-to-starboard (Figure 2-22). Ensure the other boat understands your intentions before proceeding.

Figure 2-22. Passing Starboard-to-Starboard

Crossing

When engaged in a crossing situation, where two vessels are approaching at right angles (or close to) and a risk of collision exists, the vessel on the right is the stand-on vessel and must hold course and speed. The give-way vessel must maneuver in such a way as to keep clear of the stand-on vessel. The give-way vessel must pass to the stern of the stand-on vessel. The give-way vessel shall slow, stop, or reverse to allow the stand-on vessel to pass.

Overtaking

If one boat wishes to overtake (pass) another boat, the vessel astern must initiate the signal indicating his desire to pass. The vessel being passed (overtaken) is the stand-on vessel. The boat doing the passing (overtaking) is the give-way vessel (Figure 2-23).

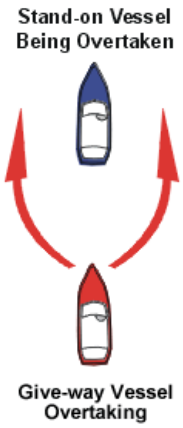


Figure 2-23. Overtaking

To pass on the port side you should signal two (2) short blasts. To pass on the starboard side you should signal one (1) short blast.

Visual Obstructions

When piloting the boat, the operators vision may be obstructed by high trim angles and the sea state. Other factors that can affect operator vision include, but may not be limited to:

- Acceleration
- Darkness
- Fog
- Interior Lights
- Load Distribution
- Obstruction in Field of Vision
- Propulsion-Engine Trim Angles
- Rain and Weather
- Speed
- Obstruction in Field of Vision

Propeller Safety

The propeller is the mechanical component that drives your boat through the water and as a moving piece of equipment is dangerous. As the owner/operator, you are required to understand propeller safety and the steps necessary to prevent injuries to you and your passengers.

At a *minimum*:

- **RECOGNIZE** that propellers are dangerous and can cause injury and/or death.
- **ALWAYS** stop the engine(s) before entering or exiting the water. Ensure the propeller(s) has come to a complete stop.
- **NEVER** start the engine(s) when someone is near and/or around the propeller(s). Injury to the individual may result.
- **ALWAYS** supervise individuals who are swimming near and/or around the propeller(s). Ensure they understand the dangers of propellers.
- **NEVER** work on propeller while the engine(s) is running.
- **NEVER** attempt to clear debris from the engine(s) water intake while the motor is running.

The above is the minimum steps you should take to prevent propeller strikes and injury. For additional information contact a qualified safety boating program and/or the U.S. Coast Guard.

As the owner/operator, you are responsible for disseminating propeller safety to your passengers and ensuring they understand and follow all propeller safety procedures.

Boating Regulations and Requirements

In the United States, Federal law mandates that as the owner/operator you have a responsibility to yourself and your passengers to always operate your vessel in a safe manner. As the owner/operator, you should always check the regulatory procedures and/or requirements for the country of registration as regulations and responsibilities may changed from country to country.

As the owner/operator, you are responsible for any documentation or registration required. All undocumented vessels equipped with propulsion machinery must be registered in the State or country of principal use. A certificate of number is issued upon registering the vessel. These numbers must be displayed on your vessel. The owner/operator of a vessel must carry a valid certificate whenever the vessel is in use. In the United States if the vessel is moved to a new State of principal use, the certificate is valid for 60 days. Some states require all vessels to be numbered. Requirements in other countries may vary.

Some vessels may be documented. The certificate of documentation MUST be on board a documented vessel at all times.

In the United States further questions may be directed to the ***United States Coast Guard Boating Safety Hotline***.

U.S. Coast Guard Boating Safety Hotline

The ***U.S. Coast Guard Boating Safety Hotline*** is 800-368-5647.

Call Toll-Free for information regarding:

- Information on boating safety recalls.
- To comment on U.S.C.G. boarding procedures.
- For answers to boating safety questions.
- For boating safety literature.

Supplemental Federal, State or Local Regulations

It is the owner/operator's responsibility to be aware of any other Federal, State or local regulations that may be in effect. Examples include, but are not limited to:

Discharge of Oil	The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon or discoloration of the surface of the water or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5000.
Solid Waste Disposal (Marpol Treaty)	The Act to Prevent Pollution from Ships places limitations on the discharge of garbage from vessels. It is illegal to dump plastic trash anywhere in the ocean or navigable waters of the United States, including the Great Lakes. The discharge of other types of garbage is permitted outside of specific distance offshore as determined by the nature of that garbage. See *Federal Requirements and Safety Tips for Recreational Boats* for more detail.

Other Waste	The Refuse Act of 1899 prohibits throwing discharging or depositing any refuse matter of any kind (including trash, garbage, oil and other liquid pollutants) into the waters of the United States.
Marine Sanitation	All recreational boats with installed toilet facilities must have an operable marine sanitation device (MSD) aboard. Vessels 65 feet and under may use a Type I, II, or III MSD. All installed MSD's must be Coast Guard certified. The Holding Tank installed in the Chris-Craft is certified by definition under the regulations and is not specifically labeled.
Speed	Local speed laws are often posted to prevent wake damage to shore side facilities, to slow boaters in crowded or confined situations, and to preserve wildlife and wildlife habitats. Penalties for violations are often very high.
Wake	No wake zones are usually posted to prevent damage to shore side facilities. It is the operator's responsibility to operate the boat at a speed that does not produce a damaging wake, even if the speed is below a posted speed limit.

Alcohol and Drugs

Operating your Chris-Craft under the influence of alcohol and/or drugs may cause serious injury. Do not drink alcohol and/or take drugs and operate the vessel.

It is the responsibility of the owner/operator to ensure that the vessel operator is not under the influence of drugs and/or alcohol. In the United States, boating while intoxicated (BWI) became a Federal offense January 13, 1988. If the Blood Alcohol Content (BAC) is 0.10% (0.08% in some States) or higher for operators of recreational vessels being used only for pleasure, violators are subject to a civil penalty not to exceed $1000 or criminal penalty not to exceed $5000 or both. Other State or local penalties may apply.

Accident Reporting

In the United States, all boating accidents must be reported by the operator or owner of the vessel to the proper marine law enforcement authority for the State in which the accident occurred.

Accidents involving more then $500 damage or complete loss of the vessel must have a formal report filed within 10 days. Accidents involving death or disappearance must be reported immediately. Accidents involving injury requiring more than first aid must have a report filed within 48 hours.

If you need further information regarding accident reporting, please call:

United States Coast Guard Boating Safety Hotline

800-368-5647

It is the owner/operator's responsibility to determine the regulations in effect in areas outside the United States.

Rendering Assistance

The master or person in charge of a vessel is obligated by law to provide assistance that can be safely provided to any individual or vessel in distress, as long as his vessel is not endangered in the process. The master or person in charge is subject to a fine and/or imprisonment for failure to do so (CFR Title 46).

Vessel Maintenance

As the owner/operator, you are responsible for keeping your vessel in a safe operating condition. Regularly scheduled maintenance is mandatory for this to occur.

Load Capacity

Loading and capacity refers to the weight of:

- People
- Fuel
- Gear
- Any item carried aboard the boat.

When loading the boat keep the following in mind:

- Overloading violates existing regulations. NEVER carry more weight than authorized for the class of boat.
- Improper loading and/or distribution of weight is a significant cause of accidents.

Capacity limits and weight distribution apply to moderate weather conditions. If the weather changes and seas become rough, the load distribution of the boat will affect its handling characteristics.

For additional information on load capacities and weight distribution, refer to a good boating course and/or the U.S. Coast Guard.

> ***As the owner/operator, you are responsible for the safe loading and weight distribution of your boat.***

Safety Equipment

In the United States the operator of a vessel is responsible for the minimum safety equipment required by the U.S. Coast Guard. Safety equipment should be maintained on a regular basis and must be stowed where it is accessible in a reasonable amount of time in an emergency. Some safety equipment must be Coast Guard approved. “Coast Guard Approved Equipment” has been determined to be in compliance with USCG specifications and regulations relating to performance, construction or materials.

As the owner/operator, you should always check the safety procedures and/or requirements for the country of registration as regulations and responsibilities may changed from country to country.

A complete list of required equipment, Federal rules and regulations and other valuable links can be found on the ***United States Coast Guard Boating Safety*** web page: **www.uscgboating.org**

A Quick Reference Chart of the Federal Requirements for recreational boats can be found at:

http://www.uscgboating.org/safety/fedreqs/equ_refchart.htm

Read and understand all pamphlets and brochures supplied with safety equipment. Become familiar with how the equipment operates and stow all safety equipment properly.

At a minimum you should have the following safety equipment available (Table 2-1):

Table 2-1. Minimum Required Safety Equipment

Vessel Length (in Feet)		Equipment	Requirement
16–25	26–39		
✓	✓	Life Jackets (PFDs)	**(a)** One Type I, II, III, or V wearable PFD for each person on board. (USCG approved)
✓	✓		**(b)** In addition to paragraph (a), must carry One Type IV (throwable) PFD.
		Visual Distress Signal (VDS)	**(a)** One electric distress light or Three combination (day/night) red flares. (Note: only required to be carried on board when operating between sun-set and sunrise.)
✓	✓		**(b)** One orange distress flag and One electric dis-tress light - or -Three hand-held or floating orange smoke signals and One electric distress light - or - Three combination (day/night) red flares: hand-held, meteor or parachute type.
✓		Fire Extinguishers	**(a)** One B-I (when enclosed compartment)
	✓		**(b)** One B-II or Two B-I. (Note: Fixed system equals One B-I.)
			(c) One B-II and One B-I or Three B-I. (Note: Fixed system equals One B-I or Two B-II.)
✓	✓	Backfire Flame Arrestor	Required on all gasoline engines except outboard motors.
✓	✓	Navigation Lights	Required to be displayed from sunset to sunrise and in or near areas of reduced visibility.

Table courtesy of the U.S. Coast Guard.

Personal Flotation Devices (PFDs)

Federal regulations require that you have at least one Coast Guard-approved Personal Flotation Device (PFD) for each occupant in a recreational boat. All PFDs must be in serviceable condition, readily accessible, and legibly marked with the Coast Guard approval number. Each PFD must be of the appropriate type and size for each individual occupying the boat.

The Coast Guard recommends, and many states require, wearing the appropriate PFD when:

- Water-skiing and other towed activities.
- While operating personal watercraft (PWC).
- During white water boating activities.
- While sailboarding (under Federal law sailboards are not boats).

Laws governing the use of a particular type of PFD for a particular activity varies from state-to-state. Some states require that children wear a PFD at all times. For clarification on any state requirement, check with the state boating safety officials.

There are three kinds of PFDs: Foam, Inflatable, and Hybrid.

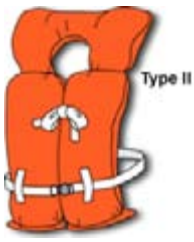
Within these three kinds there are five classes, known as Types, of PFDs, four wearable and one throwable. Only Type I is designed to turn an unconscious person’s face upward, out of the water.

The best PFD is the one that you wear. When boating always wear your PFD.

Types of PFDs

There are five types of PFDs:

Table 2-2. Types of PFDs

Type	Description	Illustration
I	**Offshore:** Provides most buoyancy. Designed for remote or rough waters where rescue may take awhile. Keeps head out of water in face-up position. Comes in two sizes: adult and child.	
II	**Near-Shore:** Intended for calm and inland waters where rescue may be quick. May turn unconscious wearer face-up. Not as efficient as Type I.	
III	**Flotation Aids:** Vest or full-sleeved jacket style. Intended for calm waters. Not recommended for rough waters as they may not keep individual face-up. Generally used for water sports. Most comfortable for continuous wear. Some Type III's are designed to inflate when you enter the water.	
IV	**Throwable Devices:** Cushion, horseshoe, or ring buoy style. Designed to be thrown to someone in the water. Not designed as a personal flotation device that can be constantly worn. Should be attached to a polypropylene rope. For emergency use only.	
V	**Special Use Device:** Designed for specific activities such as kayaking or water skiing. Varieties include deck suits, work vests, board sailing vests, and hybrid types. If counted as a minimum PFD requirement, it must be worn and used in accordance with their label. **Hybrid Inflatable:** Least bulky of all PFD types. Has both foam and an inflatable chamber. Performance equal to Type I, II, or III PFDs when inflated. To be acceptable, hybrid PFDs must be worn when underway.	

Foam Class PFDs

Foam type PFDs are inherently buoyant and are used for:

- Adult, Youth, Child, and Infants
- Swimmers, poor swimmers, and non-swimmers

Table 2-3. PFD Minimum Buoyancy Requirements – Foam

Wearable Size	Type	Inherent Buoyancy (Foam)
Adult	I II & III V	22 pounds 15.5 pounds 15.5 to 22 pounds
Youth	II & III V	11 pounds 11 to 15.5 pounds
Child and Infant	II	7 pounds
Throwable: Cushion Ring Buoy	IV	20 pounds 16.5 & 32 pounds
The throwable PFD is only available in the Foam class.		

Inflatable Class PFDs

The inflatable PFD may be more comfortable to wear but may not be used by children under 16 years of age. Each inflatable PFD must have an operational gas cylinder and the individual must be knowledgeable in its use and the condition of the PFD. Inflatable PFDs may not satisfy the requirement to carry PFDs, as established by Federal Regulations.

Table 2-4. PFD Minimum Buoyancy Requirements – Inflatable

Wearable Size	Type	Inherent Buoyancy
Adult	I & II III V	34 pounds 22.5 pounds 22.5 to 34 pounds

Hybrid Class PFDs

Hybrid PFDs are both foam filled and are inflatable.

Table 2-5. PFD Minimum Buoyancy Requirements – Hybrid

Wearable Size	Type	Inherent Buoyancy	Inflated Total Buoyancy
Adult	II & III V	10 pounds 7.5 pounds	22 pounds 22 pounds
Youth	II & III V	9 pounds 7.5 pounds	15 pounds 15 pounds
Child	II	7 pounds	12 pounds

PFD Considerations

To obtain the best benefit from a PFD:

- Children, non and poor swimmers should wear a PFD at all times.
- Keep all PFDs in an accessible location.
- Ensure the PFD comfortably fits the individual, both in and out of the water.
- Practice using the PFD in the water. This will provide insight and confidence in its use.
- Teach all children how to put on and wear the PFD.

PFD Care:

- Do not store in plastic bags, locked in a compartment, or stowed beneath other gear.
- Do not store when wet. Allow to dry thoroughly. Do not use a radiator or heater to dry.
- Store in a well-ventilated area.
- Keep PFDs away from sharp objects. Do not puncture.
- Inspect on a regular basis. Replace any damaged PFD. Ensure inflatable PFDs have no leaks.

Additional Equipment

Safety equipment recommended by the Coast Guard should be considered the absolute minimum requirements. Your inventory of safety related devices depends on where you operate your boat and your personal desired degree of self-sufficiency. Other equipment to consider includes, but is not limited to:

- Anchor and Sea Anchor
- Binoculars
- Boat hook
- Emergency Position Indicating Radio beacon (EPIRB)
- Extra clothing
- First Aid Kit
- Flashlights
- Food and water
- Hand Pump
- Spare Fuel
- Sunglasses
- Throwable device
- Tool kit
- VHF Radio
- Visual Distress Signals
- Whistle or bell (sound device)

Tools:

- Adjustable wrench
- Duct tape
- Electricians' tape
- Hammer
- Jackknife/Pocket knife
- Lubricating oil
- Pliers (various types)
- Prop wrench
- Screwdrivers (various sizes)
- Spark plug wrench

Spare Parts:

- Extra bulbs
- Extra drain plug
- Extra fuses
- Extra prop nut/washer
- Spare propeller
- Spare wire
- Spark plugs

Visual Distress Signals

As the owner/operator, you are responsible for any visual distress requirements (signals) that you may be required to carry. It is the owner/operator's responsibility to provide proper storage, understand how to handle, and know how to dispose of these devices. These requirements can be found at:

http://www.uscgboating.org/safety/fedreqs/equ_vds.htm

There are two types of Visual Distress Signals in use:

- Pyrotechnic type
- Non-Pyrotechnic type

Table 2-6 lists the types of Visual Distress Signals available which are **Coast Guard approved**.

Table 2-6. Visual Distress Signals

Pyrotechnic Visual Distress Signals		
Description	**Use**	**CG Approval Number**
Hand-Held Flare	Day/Night	160.021
Floating Orange Smoke	Day Only	160.022
Pistol Parachute Red Flare	Day/Night	160.024
Hand-Held Parachute Red Flare	Day/Night	160.036
Hand-Held Orange Smoke	Day Only	160.037
Floating Orange Smoke	Day Only	160.057
Red Aerial Pyrotechnic Flare	Day/Night	160.066
Non-Pyrotechnic Visual Distress Signals		
Distress Flag	Day Only	160.072
Electric SOS Distress Light	Night Only	161.013

Storage

Store all VDS devices in a cool, dry place. Ensure they are protected from children, rain, sea spray, and high humidity. By law these devices must be readily accessible, where they can be reach quickly regardless of the operating conditions.

Disposal

Pyrotechnics are valid for 42 months from date of manufacture. Each pyrotechnic has a date stamp indicating its expiration date. Any VDS that is damaged or wet may not perform in the intended manner, posing a hazard to the user and must be disposed of. To dispose of expired or damaged pyrotechnics, contact the nearest law enforcement agency or fire department.

Emergencies

As the owner/operator of your vessel, you are responsible to know how to react to various emergencies. This section lists a few of the emergencies you may come across, but is not all-inclusive of the type of incidents you may encounter.

Medical

Medical emergencies, both major and minor, are rare among boaters but they do occur, and help is not always immediately available. Depending upon your situation and circumstances, at least two people should be CPR certified and have taken a first aid course. Your vessel should also be equipped with a quality first aid kit.

Some of the major medical emergencies you could encounter consist of, but are not limited to:

- Drowning
- Near drowning
- Hypothermia
- Carbon Monoxide poisoning
- Trauma from falling

Some of the minor emergencies you could encounter consist of, but are not limited to:

- Seasickness
- Heat illness
- Sunburns
- Skin burns (touching hot machinery)
- Minor fall (bruises, tissue injury)

Use caution when swimming where jellyfish are in concentration. Never swim where sewage contamination exists.

Getting Help

When at sea do not expect to receive help immediately if you have a medical emergency. You must rely upon yourself and your ability. Be prepared. Obtain and keep aboard, a good, quality book on first aid. Obtain basic first aid skills. Learning CPR is always a good idea for both sea and shore activities. CPR courses are available at your local school, hospital or Red Cross.

Being prepared for medical emergencies is always the best course of action to take.

Carbon Monoxide

Carbon Monoxide is an odorless, colorless, tasteless gas. Carbon Monoxide can kill you. Ensure there is adequate ventilation when running engines, generators, and other fuel burning equipment. When the vessel is docked, anchored, or moored, open all doors, windows, and hatches to distribute fresh air and provide adequate air circulation. If Carbon Monoxide poisoning is suspected, obtain medical attention immediately.

Carbon Monoxide (CO) is produced when a carbon-based fuel – gasoline, diesel, propane, charcoal, oil, etc. – burns. On a boat, sources of CO may include, but is not limited to:

- Engines
- Generators
- Barbecues
- Portable space heaters

It is the owner/operator's responsibility to recognize CO poisoning. Symptoms include, but may not be limited to:

- Dizziness
- Weakness
- Irritated eyes
- Ears ringing
- Headaches
- Nausea
- **Unconsciousness**

Early symptoms of CO poisoning are often confused with seasickness or intoxication, thus those individuals affected may not receive adequate medical attention. As the owner/operator, you must be aware of Carbon Monoxide concentrations and its effects on passengers and crew. Dangerous concentrations of Carbon Monoxide may be present if:

- There is leakage in the engine exhaust system.
- There is leakage in a generator exhaust system.
- There is insufficient fresh air circulation.
- Fumes move from the aft section of the vessel into the cabin and cockpit area.
- Exhaust gas becomes trapped in enclosed places.
- Exhaust outlets become blocked.
- A back draft or “station wagon effect” occurs.
- Your vessel is situated next to, and receives exhaust from, the neighboring vessel.
- Your vessel is slow, idling, or stopped.

Carbon Monoxide is colorless, odorless, and tasteless.

To protect yourself and passengers from CO poisoning:

- Maintain sufficient ventilation at all times.
- Operate all fuel-burning appliances in a location where fresh air can circulate.
- Keep all passengers away from exhaust outlets.
- If fumes are detected, CO is present. Take steps to ventilate the area.
- Symptoms of seasickness could be CO poisoning. Get the affected person to fresh air. Seek medical attention, unless you are positive it is NOT Carbon Monoxide poisoning.
- Review the Coast Guard pamphlet included with this documentation.
- Get a vessel safety check.

Current and archived carbon monoxide alerts may be found at:

http://www.uscgboating.org/alerts/alertsview.aspx?id=8

Man Overboard

If a person falls overboard, you may have only minutes to perform a successful rescue.

This manual cannot address every man overboard situation, therefore it is incumbent upon the owner/operator to learn man overboard rescue techniques. Practicing man overboard techniques is an excellent way to prepare for an actual emergency.

Water temperature is a major component in a rescue attempt due to the danger of hypothermia. If the water temperature is below 21° C (70° F), hypothermia can quickly set in, incapacitate, and kill an individual. Cold water removes body heat 25 times faster than air, therefore it is imperative to rescue the victim as quickly as possible.

Water rescue consists of three phases:

- Returning to the victim
- Making contact with the victim
- Getting the victim back aboard the vessel

If an individual falls overboard it is imperative to locate and return to the victim. If at night, use all available light sources to locate the individual. Locating and returning to the individual include, but may not be limited to:

1. Make everyone aware of the incident.
2. Visually locate and keep the victim in sight.
3. Slow the vessel when heading towards the victim.
4. When in range, throw a life preserver, even if the victim is wearing a flotation device. This provides and serves as another marker.

Employ the following steps when making contact with the victim:

1. Use a circling procedure and attempt the approach by heading into the wind or into the waves. This allows the victim to drift towards the boat.
2. Maintain a constant visual of the victim.
3. When close to the victim, alongside, stop the engine to prevent the propeller from windmilling.

Do not enter the water except as a last resort. If you must enter the water, ensure you wear a personal flotation device (PFD) and a safety line attached to the vessel. Use extra protection/precautions if the water temperature is cold.

When retrieving the victim:

- Attempt to reach the victim with a pole, rope, or life preserver.
- Help the individual back into the vessel.
  - It is very difficult to pull a victim back into the boat via the sides. The most effective recovery is at the swim platform located at the stern.
- If the person is injured, going into the water may be the only recourse. Wear a personal flotation device (PFD) and attach yourself to the vessel with a rope.
- Handle the victim with care. Be aware of spinal injuries.
- If required, treat the victim for hypothermia.
- If required, obtain medical attention as rapidly as possible.

Fire

When fighting fires:

- If possible, throw burning materials over the side.
- Never use water, or water-type extinguishers on gasoline, oil, grease, or electrical fire. Water spreads the flames and acts as a conductor for electricity.
- Pull the safety pin and aim the fire extinguisher at the base of the flames. Squeeze the handle and use a left-to-right sweeping motion to extinguish the flames.
- Signal for help using an appropriate signaling device.
- If required, abandon ship, but only as a last resort.

To help reduce the possibility of fire, store flammable materials in an approved shipboard storage container.

Classes of Fires

In the United States there are four classes of fire of which you should be familiar with. They are:

- **Class A** – Wood, paper, textiles, trash, and other ordinary combustibles
- **Class B** – Flammable liquids, oils, solvents, paints, grease, fuels, etc.
- **Class C** – Electrical, energized electrical equipment
- **Class D** – Combustible metals (magnesium, titanium, potassium, etc.)

NOTICE

Dry Powder type extinguishers are used on Class D (combustible metals) type fires. This type of fire is rare on a boat of this type and therefore not discussed.

Compliant Fire Extinguishers

Fire fighting extinguishers have been developed to combat the various classes of fires. These are:

- Water
- Carbon Dioxide
- Multipurpose Dry Chemical
- Foam

Some extinguishers are classified as multipurpose, meaning they can be used on more than one type of fire. For this reason you should equip the vessel with at least two different types of fire extinguishers, one for general purpose (such as Carbon Dioxide) and another for fuel (such as Multipurpose Dry Chemical or Foam). Table 2-7 indicates which type of extinguisher works best for which class of fire.

Table 2-7. Class of Fire and Extinguisher Types

Class of Fire	Extinguisher Type			
	Water	Carbon Dioxide	Multipurpose Dry Chemical	Foam
A	**Best**	Good	Good	Good
B		Good	**Best**	**Best**
C		**Best**		

It is essential that you have, maintain, and regularly inspect fire extinguishers. As the owner/operator, it is imperative that you learn the differences between the different types of fires that can occur aboard your boat. With this knowledge you can quickly extinguish fires with the proper type of fire extinguisher.

Required Number of Portable Fire Extinguishers

The overall length of the boat determines the minimum number of portable fire extinguishers required. Also, vessels with an approved fixed fire fighting system require fewer extinguishers, as explained in Table 2-8.

Table 2-8. Minimum Portable Fire Extinguishers Required

Vessel Length	No Fixed System ((Qty) and Type)	With Approved Fixed System ((Qty) and Type)
Less than 7.9m (26 ft)	(1) B-I	0
7.9m (26 ft) to less than 12.2m (40 ft)	(2) B-I or (1) B-II	(1) B-I

Fire Extinguisher Maintenance and Service

The boat owner/operator shall:

- Have fire-fighting equipment checked at the intervals indicated on the equipment.
- Replace portable fire extinguishers, if expired or discharged, by devices of identical fire fighting capacity.
- Have fixed system systems refilled or replaced when expired or discharged.

Any fire extinguisher that does not satisfy the maintenance requirements must be replaced, or recharged. If recharging a fire extinguisher, be sure to use a qualified fire extinguisher servicing company.

Safety at Sea

Hitting underwater objects, or boating in dangerous conditions can cause serious injury or death. Always know where you are going, where the hazards are, and avoid them. If you find yourself in uncharted waters, boat very slowly and post a lookout.

As the owner/operator, it is your responsibility to know where obstructions are, recognize shallow water, and avoid unnavigable conditions such as dangerous currents. To achieve this you must be familiar with, and know how to read, nautical charts. Nautical charts, and navigation data, are available from the National Oceanic and Atmospheric Administration (NOAA – web address: **www.noaa.gov**).

As the owner/operator, you must observe and understand all navigational aids, be aware of tide times (where appropriate), and acquaint yourself with new technologies that can help you navigate your vessel safely.

If you find yourself in unfamiliar waters, and without knowledge of the hazards, proceed slowly and post a lookout – someone to watch for hazards.

Mechanical Failures

If your vessel breaks down due to mechanical failure, perform the following procedures:

1. If necessary, set the anchor or sea anchor to avoid drifting.
2. Investigate and troubleshoot the cause of the breakdown.
3. If available, refer to the specific systems manual for additional information.
4. If possible, correct the problem.
5. If necessary, seek assistance from any nearby vessels and/or signal for help using an appropriate signaling device.

If you experience propulsion failure some items you may initially investigate are (not all inclusive):

1. Check fuel level.
2. Check for clogged fuel filters.
3. Check for a plugged tank vent.
4. Check for obstructions in the fuel lines.

Shallow Water Dangers

The minimum depth of water you are able to run your boat is determined by several factors. The draft is affected by the loading of the boat including the fore and aft trim, the propeller size and even by the salinity of the water. When your boat is fully loaded, measure the maximum depth from the waterline to the deepest point and note the number. It is the owner/operator's responsibility to maintain a comfortable margin over the bottom.

Should you run aground, visually check for water intrusion. If serious damage has occurred, it may be prudent to stay aground until the damage can be assessed and controlled. After re-floating, check the running gear for damage and feel for any unusual vibration. Perform a thorough inspection after trailering the boat.

Running Aground

NOTICE

Engine cooling intakes are located under the boat. Ensure intakes are free and clear of debris. Do not start the engines if intakes are plugged.

If you encounter shallow water and run aground:

1. Immediately place the transmissions in neutral.
2. Ensure everyone has, and is wearing, a PFD.
3. Perform a head count. Confirm everyone is present and accounted for.
4. If possible, inspect the hull, propulsion, and steering systems for damage.
5. Inspect for flooding and/or leaks.
6. If the vessel is undamaged, decide on an appropriate course of action:
   - Determine the water depth and the type of obstruction you are lodged on: sand, mud, rock, etc.
   - Is it possible to dislodge the vessel?
   - Do you need to lighten the load by removing passengers or equipment?
   - Is it possible to push the vessel off the obstruction?
   - Is it possible to use reverse thrust to free the craft?
   - Determine tide, current, and wind velocity. Will they help or hurt your situation?
7. If necessary, seek assistance from any nearby vessels and/or signal for help using an appropriate signaling device.
8. If damaged it may be safer to leave the vessel aground and seek professional help.

Flooding, Sinking, and Capsizing

If the vessel encounters flooding, swamping, or is in danger of capsizing you should, as a general measure:

1. Ensure everyone has, and is wearing, a PFD.
2. Perform a head count. Confirm everyone is present and accounted for.
3. Seek assistance from any nearby vessels.

If your vessel encounters flooding and/or hull leaks, in addition to the general measures:

1. Bring the boat to a complete stop.
2. Identify the source of the leak/flooding.
3. If possible stop or reduce leaking by using plugs, a hull patch kit, towels, rags, or any other available material.
4. Engage the bilge pump(s).
5. Assist the bilge pump(s) by removing the water with buckets or some other suitable device.
6. Abandon the vessel only as a last resort.

If the boat is in danger of capsizing, or has capsized, in addition to the general measures:

1. If you are far from shore and the vessel is not fully submerged, stay with it.
2. Climb onto the overturned hull to remove you and your passengers from the water. This helps you retain body heat and reduces the possibility of hypothermia.
3. Signal for help with an appropriate signaling device.

Collisions

If your vessel is involved in a collision and depending upon the severity of the collision, perform the following tasks:

- Ensure everyone has, and is wearing, a PFD.
- Perform a head count. Confirm everyone is present and accounted for.
- If injuries have occurred render appropriate first aid.
- Inspect the boat for damage, flooding, and/or leakage. If necessary engage the bilge pump(s).
- Attempt to stop any leaks by using plugs, a hull patch kit, towels, rags, or other available material.
- If necessary, seek assistance from any nearby vessels and/or signal for help using an appropriate signaling device.

If you are involved in a collision, you are required to file an accident report. Contact the nearest state enforcement agency or Coast Guard office. If boating outside territorial waters, consult the nation you are visiting for accident reporting requirements.

Lightning Precautions

A vessel at sea may be susceptible to lightning strikes. If the vessel is struck by lightning check for injuries and apply any first aid as may be required. Also:

- Check all electrical components, including compasses to determine if damage or a change in calibration has occurred.
- Check the vessel for physical damage, system integrity, and continuity to ground.

If caught in a lightning storm, the **minimum** precautions that shall be applied are:

- All occupants shall remain inside the boat.
- Occupants shall not enter the water. Arms and legs shall not dangle in the water.
- Occupants shall refrain from making contact with components in such a way as to become an electrical bridge between such items.
- Avoid contact with any metal components that could conduct electrical current.

It is the owner/operator’s responsibility to become familiar with the dangers of lightning and learn all the precautions necessary to protect the crew, passengers, and vessel in the event of a lightning storm.

Fueling

Gasoline is very flammable and explosive. The precautions and procedures in this section are the minimum steps that should be carefully and fully observed each time the boat is fueled.

Always follow the manufacturer's recommendations for grades of fuel and oil used in your engine. Using improper products may cause damage to the engine and void your warranty.

General Procedures:

- NEVER smoke or use any flame or ignition device when fueling or around fuel.
- If possible, always fuel during daylight hours.
- Always use fresh fuel. Old fuel can form gum and varnish which may affect engine performance.
- Keep a fire extinguisher nearby.
- All persons not directly involved with the fuel operation should stand clear.
- Ensure engines are stopped and all electrical equipment turned OFF.
- If appropriate, close all hatches, ports, doors, and windows to prevent fumes from entering the cabin.

Think! Have an escape route planned before fueling.

Fueling the boat:

1. Remove the deck plate.
2. Keep the nozzle in contact with the grounded deck plate while filling. This helps prevent static electricity from creating sparks.
3. Do not over fill. Fuel flowing from the fuel tank vent may spill overboard. Fuel spills violate government regulations and may result in citations. Allow for fuel expansion.
4. NEVER leave the boat during the fueling process.

After fueling:

1. Replace the fuel deck plate. Make sure the cap is tight to prevent water from leaking into the fuel tank.
2. Wipe up any spilled fuel on the deck and surrounding area. Dispose of rags properly.
3. If appropriate, open any hatches, ports, doors, and windows to ventilate the cabin.
4. Investigate for leaks and drips. Make any corrections necessary.

NOTICE

The fuel deck plate cap is fitted with an O-ring that over time may become worn and/or damaged. Inspect the cap on a regular basis and replace as necessary.

CHAPTER 3

Systems

There are several systems and components associated with your Chris-Craft. This chapter provides an overview and functional description of these systems. However, it is not, nor intended to be, a replacement or substitute for the component manuals that accompany your boat.

At the time of this writing, the information contained in this chapter is current and up to date. However, specifications are subject to change without notice. If there is a discrepancy between the information in this chapter and a component manual, the component manual takes precedence.

It is the owner/operator's responsibility to remain current on any changes that may affect the operation and safety of the boat.

Switch Identification

There are numerous switches you should be aware of when operating your boat. This section identifies these switches by their icon.

Table 3-1. Switch Identification Icons

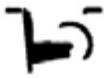
Activate Accessory Outlet	**Turn Bilge Pump ON/OFF**	**Engine Compartment Blower**	**Cockpit Lights**
Adjust Engine Drive Trim	**Open/Close Engine Hatch**	**Turn Selectable Exhaust ON/OFF**	**Horn**
Turn Nav Lights ON/OFF	**Activate Battery Parallel Circuit**	 **Rumble Seat Open/Close**	**Activate Trim Tab (one switch for each trim tab)**
Turn ON/OFF Water Pressure Pump	**Extend or Retrieve Anchor**	**Slide Helm Seat FWD and AFT**	**Dim/Brighten Dash Lights**

Figure 3-1. Helm Switch Panel

Engine Compartment

The engine compartment normally contains the following components:

- Engine(s)
- Batteries
- Trim Tab Pump (if installed)
- Engine Trim Pump
- Bilge Pump

Other components may be included within the engine compartment depending upon the model of boat and options chosen.

The engine compartment is accessed via the engine hatch located at the stern of the boat. All models except the Lancer 20, Lancer 22 Rumble, and Launch 22 utilize either a single or dual electric power lift which is activated from the helm (Figure 3-2). Actual location of this switch may vary from model to model.

The Lancer 20, Lancer 22 Rumble, and Launch 22 employs a manual latch release mechanism which utilizes a gas assisted piston to lift the engine hatch.

Figure 3-2. Engine Hatch Activation Switch

Lancer 22 Rumble

CAUTION

The Rumble seat hatch cover must be installed when the vessel is not in use.

To avoid injury, keep away from the hatch during operation.

This 22-foot boat features a 2-person seat in the middle of the foredeck similar to classic “rumble seat” boats from the past.

When the foredeck is closed, the Lancer has the same beautiful lines as the Lancer 20 and Corsairs. When opened, the Lancer 22 Rumble reveals seating for two (Figure 3-3).

A pair of hydraulic actuators opens and closes the hatch to reveal the seat. The system has its own hydraulic pump and reservoir. A rocker switch on the control panel activates the hatch.

Always keep the rumble seat cover closed when not in use. This helps prevents water intrusion and keeps the rumble seat dry when operating the boat.

Figure 3-3. Lancer 22 Rumble Seat

The hatch seal should be maintained on a regular basis by applying a thin layer of silicone sealant to the seal.

A remote key ring (Figure 3-4) is available to open/close the rumble seat and turn the cockpit lights on and off. To program the key ring:

1. Access the control unit inside the rumble seat area behind the port closeout and open the cover.
2. Locate the button located next to the LED and press once.
3. Press the upper left button on the key ring twice.
4. Replace the cover on the control unit.
5. Test for proper operation.

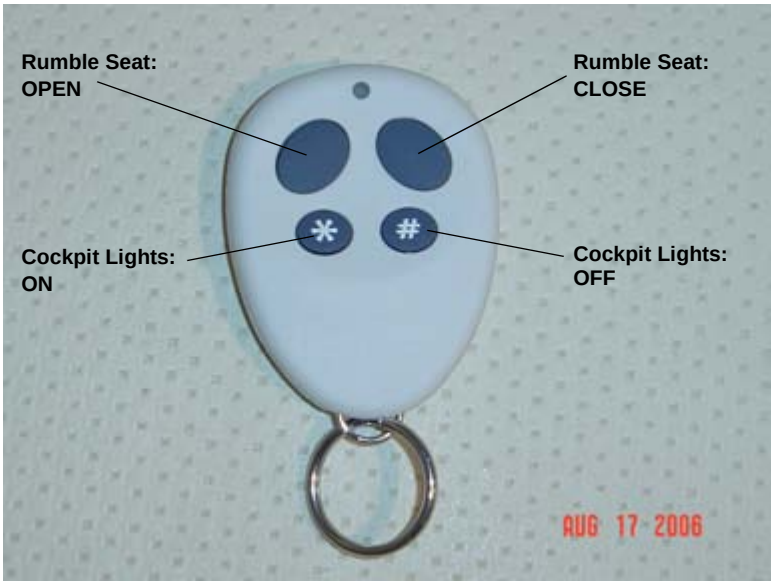


Figure 3-4. Lancer 22 Rumble Key Ring

Boat Systems

NOTICE

Most of the systems discussed are common to all the boats covered in this manual. Where major differences occur between models those differences are highlighted.

The systems/components discussed in this chapter are:

- Safety Package
- Seacocks and Thru-Hulls
- Bilge Pumps
- Fuel Systems
- Steering Systems
- Engines
- Trim Tabs
- Fresh Water System
- Electrical System
- Compass
- Entertainment and Convenience Equipment

Safety Package

⚠ CAUTION

Never restart the engine should a fire occur. Correct the malfunction that caused the fire and replace the fire bottle before you use the boat again.

The optional safety package includes the Automatic Fire Extinguisher Indicator (Figure 3-5) and an engine compartment fire extinguisher (Figure 3-6). If your boat has this option, work with your dealer to become familiar with the operation of the system.

The engine alarm monitors the engine compartment for fire. The location of the engine compartment fire indicator may vary from model to model but is generally located near the helm instrument panel.

Should an engine fire occur, the fire bottle automatically discharges.

Figure 3-5. Fire Alarm Indicator

The fire extinguishing agent used is as follows:

- For domestic use: FE241
- For international use: FM200

You should frequently check the fire extinguisher for the correct pressure. If the pressure is below specification, have the unit serviced.

You should also weigh the cylinder (less the bracket) for proper weight. If the gross weight has deviated from the specification label, service or replace the fire bottle. Weigh the cylinder at least twice a year.

Figure 3-6. Optional Engine Fire Extinguisher

Seacocks and Thru-Hulls

Each model has thru-hulls associated with it. Depending upon the model and engine configuration of your boat, it may also include one or more seacocks which allows for raw water engine cooling.

APPENDIX H provides CAD drawings for each boat model, including seacock and thru-hull locations. It is your responsibility to become familiar with those drawings appropriate for your boat.

Most seacocks are equipped with a shut-off feature, normally in the form of a ball-valve. Each seacock should be exercised periodically to ensure proper function and to prevent corrosion accumulation.

A seawater strainer, attached to the seacock, protects the system from foreign objects that may enter the seacock. The strainer should be periodically cleaned and inspected for effective operation.

Drain Plugs

⚠ CAUTION

Ensure you re-install the drain plug BEFORE putting the boat back into the water. Failure to do so will result in flooding of the engine compartment.

Garboard Drain plugs (Figure 3-7) allows water to drain from the boat when trailered. After the boat is pulled from the water, open the drain plug so as to allow accumulated water to drain. When feasible, and if applicable, rinse the area with fresh water to prevent salt buildup and corrosion.

If the boat will not be operated for more than a month, the engine should be prepared for extended storage as outlined in the Owner's Manual, Maintenance, and Warranty manual.

Figure 3-7. Garboard Drain

Bilge Pumps

The additional weight of water in the boat can adversely affect handling characteristics creating an unsafe condition. In addition the sloshing water may be corrosive to the boat's systems.

Since water is heavy (over 8 pounds per gallon) it must not be allowed to accumulate within the vessel.

It is highly recommended there be at least one hand operated pump on the vessel in the event of a bilge pump failure.

General Maintenance

On a regular basis you should:

1. Inspect the bilge pump intake and keep it free of dirt or material which may impede the flow of water through the pump.
   – To remove the pump strainer, depress the lock tabs on both sides of the pump and lift the pump motor.
2. Check the bilge pump float switch by moving it manually.
   – The float switch should move freely without sticking or binding. If it doesn't, service or replace the switch before using the boat.
3. The bilge pump should start when the float switch is raised and should stop when lowered.
   – If the pump does not start, reset the circuit breaker(s). If the pump still fails to start, replace the float switch before using the boat.
   – If you have to remove the float switch, verify proper operation of the new switch.
4. After inspection reinstall the unit.

Electric Bilge Pumps

NOTICE

It is illegal to discharge oily bilge water into the waters of the United States. Bilge oil spills must be mopped up and the oil and rags properly disposed of.

There is one bilge pump in each boat, located on the centerline in the engine compartment. All models except the Lancer 20 use the Rule 1000 GPH model. The Lancer 20 uses the 800 GPH model.

The pump may be operated in the "manual" mode by placing the bilge pump switch, located on the helm control panel, to the ON position. The indicator light on the switch illuminates indicating the pump is energized.

Do not run a bilge pump for more than a few seconds in a dry environment. Damage to the pump may result.

The bilge pump is normally wired directly to the HOUSE battery for operation in the automatic mode. In automatic mode, the bilge pump starts pumping as the water level reaches the bilge pump float switch. The HOUSE battery switch must be in the ON position for the system to work.

The bilge pump is normally held in place with clips for easy removal and cleaning. Use care when removing and/or reinstalling the bilge pump. If you remove the pump for cleaning, after reinstalling perform a systems test to ensure proper operation.

The bilge pump is protected by a circuit breaker located at the Helm Breaker Panel.

800 GPH Bilge Pump **1000 GPH Bilge Pump**

Figure 3-8. Bilge Pumps

Should a bilge pump fail to operate, check the fuse and wiring connections. If the pump operates but fails to discharge water, inspect for clogs or kinks in the discharge line.

If oil is present in the bilge, do not use the bilge pump to discharge the waste. Mop up the waste and dispose of properly.

Fuel Systems

WARNING

Leaking fuel is a fire and explosion hazard. Inspect the system on a regular basis. Inspect all fittings, valves, filters, hoses, and connections for leaks. Do not operate the engine(s) if any fuel leak is present.

Do not store fuel or flammable liquids in a closed area. Explosive vapors may accumulate.

NOTICE

The fuel system is installed and tested in accordance with American Boat and Yacht Council (ABYC) Standard H-33. Only qualified persons familiar with the practices established in this standard should make repairs or modifications to the fuel system.

The fuel system is comprised of the following components:

- Fuel Tank and Routing Lines
- Fuel Gauges/Sending Units
- Fuel Shut-off Valve(s)
- Fill Deck Plate
- Fuel Tank Vent(s)
- Fuel Filter(s)
- Fuel Fill Hose
- Fuel Tank Vent Hose
- Engine Fuel Feed Hose
- Sending Unit

Fuel Tank

NOTICE

Fuel capacities are approximate measures. Always allow for adequate reserve of fuel when operating the boat.

All Chris-Craft boats have either aluminum or crosslink polyethylene fuel tanks with varying capacities. Usable fuel will be less than capacity rating and depends upon trim conditions. Good seamanship calls for an adequate fuel reserve in all boating activities.

⚠ CAUTION

The fuel tank fill deck plate is located on the opposite side of the water fill deck plate. DO NOT put fuel in the water tank or water in the fuel tank.

The fuel fill deck plate (Figure 3-9) is located on either the starboard or port gunnel of the boat. Actual location, and physical appearance may vary from model to model, but the cap is clearly labeled.

Figure 3-9. Fuel Tank Fill Deck Plate

The fuel tank connects to the following items (Figure 3-10):

- Fuel Fill Hose
- Fuel Tank Vent Hose
- Engine Fuel Feed Hose
- Sending Unit
- Manual Shut-off Valve

Fuel tank connections may vary slightly from model to model and depends upon the type of fuel tank installed.

On some models a manually operated fuel shut-off valve is located on the fuel tank (Figure 3-10). On other models there is no manual fuel shut-off valve (Figure 3-11).

The shut-off valve is normally accessed via an access cover (Figure 3-12), generally located in the cockpit deck. Actual location and physical appearance of the access cover may vary from model to model due to fuel tank location and options chosen.

Figure 3-10. Fuel Tank Connections with Manual Shut-Off Valve

Figure 3-11. Fuel Tank Connections Without Manual Shut-Off Valve

Figure 3-12. Fuel Shut-Off Valve Access Cover (Typical)

Fuel Gauge

A sending unit is installed in each fuel tank which senses the fuel level in the tank and displays the quantity on the fuel gauge located, on the instrument panel. The gauge may vary in appearance and be clustered with other indicators, such as oil and battery readings. However it is clearly labeled. Figure 3-13 illustrates a typical cluster configuration.

The fuel indication is not 100% accurate so fuel planning is highly recommended. Maintain a reserve fuel supply when planning a trip.

Figure 3-13. Fuel Gauge

Steering Systems

Steering is provided by the propeller/sterndrive assembly itself eliminating the need of a rudder. A power steering system is used to make operating the boat easier.

A steering system owner's manual is delivered as part of the documentation package you receive when you take possession of your boat. It is your responsibility to become familiar with the contents of the manual and how the system operates, as only rudimentary information is repeated here.

A hydraulic pump, with built-in reservoir, is mounted on the engine and provides power steering for the boat. Turning the wheel pumps hydraulic fluid to the steering cylinder, which is attached to the sterndrive assembly. This fluid moves a hydraulic cylinder, which in turn moves the sterndrive in the desired direction.

As part of the regular maintenance cycle, ensure the power steering reservoir contains the proper amount of fluid. Verify with your dealer the type of steering/hydraulic fluid your boat uses. Use only the recommended brand and type of fluid recommended for your boat.

Engines

There are a variety of engine options you can select from for your boat. When you take possession of your boat, you receive the appropriate engine books for your craft. As the owner/operator, it is your responsibility to familiarize yourself with the performance specifications and maintenance requirements of your engine.

Because of the various engine options available, this manual does not discuss any one particular engine. However, there are common components associated with each engine which are discussed in this section.

Emergency Engine Stop Switches

WARNING

DO NOT remove the safety clip from the end of the lanyard. The safety clip allows the engine(s) to shut down in the event the operator becomes incapacitated or falls overboard.

When driving the boat, attach the lanyard(s) to your person and keep attached at all times. Failure to do so will not allow the engine(s) to stop should the driver fall overboard.

Do not use the emergency stop switch(es) to shut down the engines during normal operation. Damage to the engine(s) may result.

Many of the boats are available in either a single or dual engine configuration, therefore the boat will be equipped with either a single or dual emergency engine shut-off switch.

Figure 3-14 illustrates dual engine emergency shut-off switches. The switches are spring-loaded to the closed position and requires a safety clip, attached to the end of a lanyard, to keep open. The other end of the lanyard should be attached to the driver at all times. The engine will not start unless the safety clips are properly installed, keeping the shut-off switches in an open position.

To keep the switches in an open position, simply pull the switch out and insert the clip in such a position as to keep the switch from closing.

Each lanyard should:

- Be attached to the driver at all times when operating the boat. Do not allow it to become entangled at any time, in any way.
- Be long enough to prevent inadvertent engine deactivation and still allow driver free movement.

Figure 3-14. Engine Emergency Shut-off Switch

Ignition Switches

There is one ignition switch for each engine. The switch(es) are generally located on, or near the control panel (Figure 3-15) at the helm. In order for the engines to start the emergency shut-off switch(es) must be set to OPEN. This is accomplished by installing the safety clip as illustrated in Figure 3-14.

Figure 3-15. Ignition/Start Switches

CAUTION

Do not start the engines without some type of cooling water circulating through the engine(s). Damage to the engine(s) will result.

To start the engines:

1. Ensure the fuel shut-off valve on the fuel tank is in the open position.
2. If necessary turn on the master battery circuit breaker and/or engage any other circuit breaker(s) that may be required for engine start.
3. Ensure you have an adequate supply of cooling water circulating through the engine.
4. Ensure no one is around the propeller(s), and that they are free of obstacles.
5. Drop the sterndrive(s) into the water (if launching the boat).
6. Insert the clip(s) into the emergency shut-off switch(es) and attach the lanyard(s) to your person.
7. Place the throttles in NEUTRAL.
8. Activate the engine compartment blower and allow approximately four (4) minutes for the compartment to ventilate.
9. Start the engine(s).
10. Gauge readings – Normal

Ensure someone is at the controls at all times. DO NOT leave the helm unattended with the engine(s) running.

To stop the engine(s):

1. Turn the ignition switch(es) to OFF.
2. Turn off any circuit breakers necessary to prevent a restart.
3. If required, turn off the fuel shut-off valve on the fuel tank.

Do not approach the propeller(s) until the engine(s) have come to a complete stop and there is no chance that the engine will restart.

Engine Throttles

There is one throttle for each engine (Figure 3-17). The throttle(s) controls the engine(s) speed which dictates the speed of the boat through the water. The throttle combines direction and power in one unit. Moving the throttle forward increases the engine speed until full forward power is reached. Moving the throttle aft puts the boat in reverse. Continued aft movement of the throttle increases engine speed until full power is reached. The middle detent is the NEUTRAL position. The engines will not start unless the throttles are in the NEUTRAL position.

Work with your dealer for instructions on the best way of handling throttle control.

Figure 3-16. Dual Engine Throttles

The single engine throttle is located on the driver's starboard side and like the dual throttles serves two purposes:

- It regulates the engine speed, and
- It acts as a gear shift level to control the rotation of the propeller.

As you move the handle forward and backward you should feel it drop into a detent when moved into NEUTRAL position. Note that the engine will not start unless the control is in NEUTRAL.

Moving the control forward or backward increases engine speed in the direction the control is moved. This also increases the boat speed. You must squeeze the shift interlock to move the control out of NEUTRAL.

Figure 3-17. Single Engine Throttle

Engine (Power) Trim

Each engine uses a trim switch (Figure 3-18) which works in conjunction with the trim tabs and performs the following functions:

- Moves the sterndrive(s) angle up or down to provide optimum running conditions.
- Allows the boat to come up on plane more quickly and efficiently.
- The power trim also allows the sterndrive(s) to be fully raised so that the boat may be trailered or un-trailered without damaging the sterndrive/propeller.

The single engine trim may be located either on the throttle or on or near the helm switch panel (Figure 3-18). The dual engine trim switches are located near the dual engine throttles (Figure 3-19).

When using the engine trim, keep the following in mind:

- Avoid a bow-down condition. This is known as “plowing” which can result in unintentional consequences. Read-just trim to correct this condition.
- Avoid a bow-up condition. This is known as “porpoising” or “propeller ventilation.” This condition creates an unsafe propeller speed which may damage the engine(s). Reduce engine RPM and readjust trim to correct this situation.
- When attempting to come up on plane, always start with the sterndrive(s) down.

Figure 3-18. Single Engine Trim Switch

Figure 3-19. Dual Engine Trim Switches

Engine Instruments

You should become familiar with “normal” gauge readings for your engines and become accustomed to scanning the instruments when running. Unusual instrument readings require immediate attention. Do not ignore unusually high or low instrument readings. Shut down the engine and have the problem diagnosed before operating the engine.

Tachometer	The tachometer (tach) indicates the revolutions per minute (RPM) of the engine. Important RPM’s to note from the manufacturer’s engine manual include idle RPM, normal cruise RPM and maximum RPM. The maximum RPM should not be exceeded. Although tachometers do not indicate boat speed, a careful helmsmen will chart boat speed vs. RPM so that, in the event of other electronics problems, he will have a very good idea of boat speed from his tachometers. A sudden change of RPM may indicate a problem within the engine or a problem with the drive train or running gear. Do not ignore “unexplainable” changes in RPM. A simple check of the engine and running gear may prevent costly repairs.
Speedometer	Read in miles and kilometers per hour. Indicates speed of the boat.
Oil Pressure Gauge	The oil pressure gauge measures the pressure of the lubricating oil circulating through the engine. Adequate oil pressure is required to pump oil into the many highly-loaded bearings that require lubrication. Inadequate oil pressure can lead to excess wear and possibly catastrophic failure of the engine. Check the manufacturer’s engine manual to determine normal oil pressure for the engines in your boat. Shut down and do not operate an engine that has had a loss of oil pressure.

Water Temperature Gauge

The water temperature gauge indicates the temperature of the coolant mixture circulating inside the engines cooling circuit. The engine is equipped with a thermostat that controls flow of coolant within the engine thus maintaining correct operating temperature. Engine coolant temperature is not affected by seawater temperature.

Correct operating coolant temperature indications for your engine may be found in the engine manufacturer's manual. An unusual change in temperature may indicate problems with the raw water circuit or internal engine problems causing excess heat. Shut down and do not operate an engine that is indicating coolant temperature in excess of the manufacturer's maximum allowable temperature.

Voltmeter

The voltmeter monitors the voltage of the battery and the charging circuit of the engine. Normal voltage for a fully charged battery with the engines shut down is about 12.8 volts. With the engines running a charging voltage of 13 to 15 volts should be indicated. Low voltage with the engines running (less than 12 volts) indicates a possible problem with the charging circuit. The engines are unlikely to start with less than 12 volts indicated on the volt meters.

Fuel Gauge

The fuel gauge indicates the fuel *level* in the tanks. Due to the irregular shape of the fuel tanks and the angle of the tanks when running, indicated fuel *level* does not correspond directly with the ratio of remaining fuel to total fuel capacity (i.e. an indicated fuel level of 1/2 does not indicate 1/2 the capacity of the tank is remaining, but indicates the level of the fuel is 1/2 the height of the tank at the sender). Remember, not all fuel capacity is usable capacity. Careful planning of long trips using a safety reserve is advised. It is always prudent to fill the tanks completely after each use to prevent condensation within the tanks.

Engine Hour Meter

The engine hour meter is actually located on the engine itself and indicates the total cumulative time in hours of operation. The engine hours should be noted on the engine log for all oil changes, filter changes, scheduled and unscheduled maintenance. An accurate and carefully maintained engine log is a valuable tool when diagnosing problems, when seeking warranty compensation from the engine manufacturer and when your boat is re-sold.

The instrument panel layout may vary from model to model and also if the boat is single or dual engine. Figure 3-20 illustrates a typical single engine instrument panel layout.

Figure 3-20. Single Engine Instrument Configuration

Figure 3-21 illustrates a typical dual engine instrument panel layout. The actual layout may vary from model to model.

Figure 3-21. Dual Engine Instrument Configuration

Selectable Exhaust

NOTICE

Check your state and local noise laws prior to using the Corsa Selectable Exhaust system.

Chris-Craft boats offer the option of a “selectable exhaust” which provides a “throaty” sound when operating away from shore and a “muffled” exhaust when operating within basin sound limitation boundaries.

The mode is selected by a switch located on the helm control panel. Actual location of the switch may vary from model to model.

Prior to every use of the boat, examine the exhaust system to ensure tightness of the fittings.

Engine Compartment Blower

NOTICE

Ventilate the engine compartment before starting the engine(s). The compartment should be ventilated a minimum of four (4) minutes.

The engine compartment may accumulate fumes when the engines are not running. Before starting the engine(s) ventilate the engine compartment to remove any vapors that may have accumulated. The best course of action is to open the engine hatch and allow the vapors to escape. However, if that is not possible, or is inconvenient, then each boat is equipped with an engine compartment exhaust blower which can be used to ventilate the compartment. Run the blower for at least four (4) minutes to ventilate the compartment before you start the engine.

If the boat is moving slowly, gasoline fumes can accumulate because not enough air is moving through the engine compartment to keep it clear of vapors.

Anytime the boat is moving slow, engage the blower to remove any gasoline vapors that may be accumulating in the engine compartment.

Inspect the blower system prior to every use. The blower makes a distinctive sound when operating properly. If the blower is not operating, repair or replace prior to using the boat again.

The exhaust blower is activated by a switch (Figure 3-22) located on, or near, the helm control panel. Actual location of the switch may vary from model to model.

A warning label reminds you of the dangers of gasoline vapors and when to run the blower.

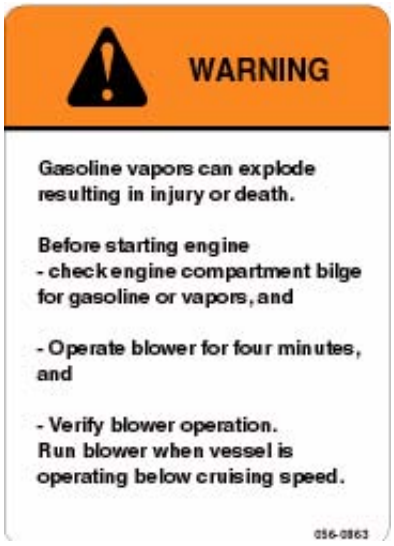

WARNING
Gasoline vapors can explode resulting in injury or death.
Before starting engine
- check engine compartment bilge for gasoline or vapors, and
- Operate blower for four minutes, and
- Verify blower operation.
Run blower when vessel is operating below cruising speed.
056-0863

Figure 3-22. Engine Compartment Blower Switch

Trim Tabs

NOTICE

Trim tabs are standard on the Launch 25, Corsair 25, Launch 28, and Corsair 28. If your model includes trim tabs, it is your responsibility to learn how trim tabs affect the handling characteristics of the boat.

⚠ CAUTION

Ensure trim tabs are completely retracted when backing the boat. Damage to the trim tabs may result otherwise.

Hydraulic Trim tabs (Figure 3-23) help adjust the vessel trim for weather, cross-winds, and water current conditions. In addition they are used to adjust for listing due to uneven loading and propeller torque.

The trim tab system consists of:

- Hydraulic Pump and Reservoir
- Trim Tabs
- Control Switches

Figure 3-23. Trim Tab

Theory of Operation

Trim tabs are used to modify the running angle of the boat. The Chris-Craft is designed to plane at a particular speed and weight distribution. As weight increases and/or speed decreases, the stern settles creating an inefficient, untrimmed condition. In this bow-high position, visibility is limited, fuel economy is poor and wake is large. Additionally the hull bottom may be pounded by waves. Trim tabs allows the vessel to plane at heavier loads and slower speeds than the designed planing speed.

Increased trim may improve the ride in a head sea by allowing the bow to cleave the waves, rather than pound over them. In a following sea, the tabs should be fully retracted for maximum steering response. A listing condition may be corrected by applying more trim on one side. Too much trim will increase the drag and cause the bow to “dig in” allowing wave action to veer the boat.

As the owner/operator, it is you responsibility to understand how trim tabs affect the characteristics of the boat. The Trim Tab Owner’s Manual that accompanies this vessel provides additional operating and safety instructions, which is not repeated here. However at a minimum:

- Use trim tabs only at cruising speeds.
- Do not use more tab than is actually needed for good performance.
- Do not reduce the running angle less than 2°.
- Do not use the trim tabs when backing or running an inlet. Damage to the cylinders and tabs my result.
- Fully retract the trim tabs when trailering the boat or if leaving the boat to sit in the water for any extended length of time.
- Spend time getting familiar with how the trim tabs affect the vessel.
- **Improper use of the trim tabs can cause an accident and/or injury.**

Trim Tab Hydraulic System

The trim tab hydraulic system is comprised of the following components:

- Hydraulic Pump
- Reservoir
- Hydraulic Cylinders

Trim Tab Hydraulic Pump

The trim tab hydraulic pump is a 12VDC electric-driven pump. When activated, the electric motor pumps hydraulic fluid to the hydraulic cylinder located on each tab. The high-pressure oil drives the piston downwards and pivots the aft section of the trim tab down below the bottom of the boat.

Trim Tab Reservoir

A hydraulic reservoir is built into the base of the pump. Fluid is drawn from the reservoir when the tabs are driven downward and returned to the reservoir when the tabs retract.

Verify fluid level in the hydraulic pump reservoir on a regular basis. With the trim tabs completely retracted the fluid level should be about two (2) inches from the bottom of the reservoir. To refill, remove lexan cover and filler plug located at the front left hand corner of the reservoir. Fill with any type of Automatic Transmission Fluid (ATF) only. Brands of ATF can be mixed.

Trim Tab Zinc Plate

Each trim tab contains a sacrificial zinc plate (Figure 3-24) which prevents the development of corrosion on the tab. This plate should be inspected and replaced when necessary.

Figure 3-24. Sacrificial Zinc Plate

Trim Tab Control Switches

There is a trim tab switch for each trim tab. The trim tab switches (Figure 3-25) are generally located on the ignition control panel. When pressed, the switch activates the pressure pump that moves the trim tab in the desired direction. Actual location of the switches may vary from model to model.

To correct for a listing condition you must lower the trim tab on the listed (lower) side by pushing the top half of the rocker switch in a half second burst until the boat is righted.

If the stern of the boat is highly loaded, use both switches to operate both tabs, which lowers the bow when the boat is on plane.

Figure 3-25. Trim Tab Control Switches

Fresh Water System

CAUTION

The water tank fill deck plate is located on the opposite side of the fuel fill deck plate. DO NOT put fuel in the water tank or water in the fuel tank.

The following models have a fresh water tank:

- Launch 22 – Optional Transom Fresh Water Shower
- Lancer 22 – Optional Transom Fresh Water Shower
- Launch 25 – Standard
- Launch 28 – Standard
- Corsair 25 – Standard
- Corsair 28 – Standard

The components of the water system consists of:

- Water Tank
- Pressure Pump
- Water Fill Plate
- Transom Shower
- Piping

A fresh water deck fill is located on the side of the boat and clearly marked WATER. Actual location and physical appearance of the fill plate may vary from model to model, but it is clearly labeled.

The water pressure pump (Figure 3-26) is a pressure-demand type pump. When energized the pump immediately pressurizes the water system. When the operating pressure is reached the pump shuts off until it senses a loss of pressure, such as a faucet being opened, at which time it is automatically re-energized.

If the pump cycles on and off without a faucet being opened it may indicate a pressure leak in the system or excessive air in the system. Bleed the system of air by opening all faucets until only water is flowing from each. If a leak is present, or suspected, find and repair the leak.

A fresh water filter is attached to the pump and should be replaced seasonally (every 6 to 12 months) or when taste and/or odor problems return. The pump and filter is located in the engine compartment. Actual orientation of the pump and filter may vary from model to model.

When air enters the system it becomes necessary to purge it for proper operation. To bleed the system of air, follow the steps outlined in “Using the Fresh Water System” on page 35.

Figure 3-26. Fresh Water Pump and Filter

A switch (Figure 3-27) on the helm switch panel energizes the pump.

Figure 3-27. Fresh Water Pressure Pump Switch

The transom shower (Figure 3-28) is a convenience option for a quick rinse-off after a swim. This feature is not available on the Lancer 20.

Figure 3-28. Transom Shower Head

Some models offer a wet bar option for entertaining purposes (Figure 3-29). When closing the lid on the sink, ensure the faucet is OFF to prevent draining the water tank.

Figure 3-29. Wet Bar/Sink

Sanitizing the Fresh Water System

Sanitizing solution contains bleach. Do not drink. Tag all faucets to notify that the system is being sanitized.

You should always sanitize the fresh water system under the following conditions:

- Before using it the first time.
- After winter storage.
- When the system has not been used for an extended period.

To sanitize the water system:

1. Ensure the water tank is empty before beginning this process.
2. You will need approximately one (1) gallon of weak bleach solution for each fifteen (15) gallons of tank water.
3. In an appropriate size bucket, make a solution bleach and water using ¼ cup of household, unscented bleach per gallon of fresh water.
4. Dump water into water tank. Fill the remainder of the tank with fresh water.
5. Activate the water pump and allow air to bleed from the system. Ensure the sanitizing solution is in all parts of the water system.
6. Allow treated water solution to remain in the system for three to four hours.
7. Drain treated water solution from lines and empty tank.
8. Flush entire system with fresh water, ensuring that all air bled from the system.
9. Empty the system completely, refill, and bleed of air. The system is now ready to use.

If fresh water has an excessive chlorine taste after sanitizing the system:

1. Pour a solution of 1 quart (0.95 liter) of vinegar and 5 gallons (19 liters) of fresh water into the water tank.
2. Allow the solution to stand for three days.
3. Drain the entire system and thoroughly flush with fresh water.

Using the Fresh Water System

On some models the water tank fill deck plate may be located in the general vicinity of the fuel fill deck plate. DO NOT put fuel in the water tank or water in the fuel tank.

Always keep the fresh water tank full. A full water tank helps keep the water potable. To fill the water tank:

1. Ensure the water supply is suitable for drinking. If filling from the dock check with the dockmaster to verify the water is potable.
2. Remove the filler cap and fill the tank until water flows from the vent.
3. Secure the filler cap.

You will need to start the system whenever the tank is empty and air is in the supply lines. To start/use the fresh water system:

1. Sanitize the system as previously described.
2. Fill the water tank with potable water.
3. Energize the pressure pump.
   – The boat must have electrical power to energize the pressure pump. This can be the batteries, or if so equipped, an external power source.
   – Turn on the water pressure switch on the helm switch panel.
4. If a hot water system is installed on your boat, open a hot water faucet to fill the water heater and allow air to escape from the line. Close the faucet when free of air.
5. Starting with the cold water faucet furthest from the pump, open each faucet until you see a steady stream of water from each faucet. Close the faucets.
6. If the boat is equipped with a water heater, open the faucet furthest from the water heater first then open all other faucets. Run until you see a steady stream of water from each faucet. Close the faucets.
7. Refill the water tank and turn off the pressure pump.

Troubleshooting Water Systems

Use the following procedure to help troubleshoot any water problem.

Table 3-2. Water Troubleshooting Chart

Problem	Probable Cause	Solution
Sea water pressure low	Seacock valve partially closed	Open valve
	Seacock strainer clogged	Clean strainer
Water sputters from faucet	Water tank empty	Fill water tank
	Air in system	Open faucet to exhaust air, close faucet when steady stream of water flows
Fresh water pump cycles on and off	Leak in the water system	Find and repair leak
No water when faucet is opened	Pump breaker off	Switch breaker to ON
	Water tank empty	Fill water tank
	Blocked water lines	Find and clear obstruction
	Defective pump pressure switch	Replace switch
Pump does not run	Pump breaker OFF	Switch breaker to ON
	Loose electrical connections	Check connections, tighten as needed
	Defective pump pressure switch	Replace switch
	Defective pump	Refer to dealer for service

Marine Sanitation System

Waste in the holding tank can form methane, an explosive gas. Keep vent open and clear of obstructions. Keep fire and flame away when maintaining the system.

It is illegal to dump plastic trash anywhere in the ocean or navigable waters of the United States, including the Great Lakes. The discharge of other types of garbage is permitted outside of specific distance offshore as determined by the nature of that garbage.

All recreational boats with installed toilet facilities must have an operable Marine Sanitation Device (MSD) aboard. Vessels 65 feet and under may use a Type I, II, or III MSD. All installed MSD's must be Coast Guard certified. The Holding Tank installed in the Chris-Craft is certified by definition under the regulations and is not specifically labeled. Do not flush foreign objects down the MSD. Damage to the system may result.

The Marine Toilet Owner's Manual that comes in your documentation package addresses the use, maintenance, and troubleshooting of the system. It is your responsibility to become familiar with its contents as only rudimentary information is presented here. Chris-Craft uses a porta potti for most standard installation, however on the Launch 28 and Corsair models a Tecma toilet is available as an option.

A portable toilet (MSD) is available as either standard or optional equipment, depending upon the boat model. A self-contained toilet system is simple to use and maintain. Disposal of waste consists of removing the holding tank and transporting it off the boat. Dispose of the waste properly at a dump station or other approved location. Do not dump the contents over the side.

The Tecma units utilizes a grinding system that grinds all waste before it enters the pump. This system virtually eliminates clogging while consuming very little water. The cycle is completely automatic and works on a 12/24 VDC electrical system.

The Tecma system can be configured with one of two types of control switches: a one switch unit, or a two switch unit. With the one switch unit, a specific quantity of water remains in the water closet. Pressing the button begins the automatic flushing cycle.

With the two switch system, the water closet remains completely dry. Press the "Before Use" button to send a specific quantity of water into the bowl. Press the "After Use" button to begin the automatic flushing cycle. This leaves the water closet clean and dry.

Electrical System

All the models discussed in this manual have a DC electrical system, with some having an AC system. Both systems are complex entities hence it is critical that you understand how the electrical system affects the boat and its components.

Electrical Safety

NEVER:

- **Work on the electrical system while the system is energized.**
- **Modify the craft's electrical system or relevant drawings: installation, alterations, and maintenance should be performed by a competent marine electrical technician.**
- **Alter or modify the rated current amperage of over-current protective devices.**
- **Install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit.**
- **Leave the craft unattended with the electrical system energized, except automatic bilge pumps, fire protection, and alarm circuits.**
- **Allow the shore power cable to hang in the water. An electrical field may be caused which can cause injury or death to nearby swimmers.**

Electricity can be very dangerous and hazardous. It is incumbent upon the owner/operator to understand basic electrical safety before working on any electrical system associated with the vessel. Other safety considerations are:

- Disconnect shore power connections when the system is not in use.
- Use double insulated or grounded electrical appliances.
- Do not alter shore power cable connectors. Use only compatible connections.

The Electrical system is installed and tested in accordance with American Boat & Yacht Council Standard E-9 and/or ISO 10133. Only persons familiar with the practices established in this standard should make repairs or modifications to the system.

DC Electrical System

Explosive hydrogen gas is given off by charging batteries. Batteries will explode if an open flame or spark ignites the hydrogen gas. Never use an open flame in the battery area. Do not strike sparks near the batteries.

Working on engine starting circuits or alternators with battery cables connected can cause severe injury or death. Battery cables should be disconnected from the batteries before working on the engine starting circuits or the alternator.

If any circuit breaker should trip, do not activate the system until the cause of the malfunction has been determined and corrected.

The DC electrical system is a 12VDC system and is composed of the following components:

- Batteries (one or more depending upon model)
- Battery Charging System
- Circuit Breakers
- Battery Distribution Panel

The batteries are normally charged through an engine-driven alternator. A volt meter on the helm shows the charge level of each battery.

Circuit Breakers

There are numerous circuit breakers in the system to prevent an electrical overload and protect the equipment from damage.

The main breaker panel is located at the helm. The actual location of the panel will vary from model to model but the function remains the same – to protect the systems from an electrical overload or short circuit.

Other circuit breakers protect other components in the system and are located at various locations in the boat. Since these locations vary from model to model, work with your dealer to familiarize yourself with their location.

Common circuit breakers for additional systems are the windlass and accessory circuit breakers (Figure 3-30), and the stereo/bilge pump circuit breaker (Figure 3-31).

Figure 3-30. Windlass and Accessory System Circuit Breakers

Figure 3-31. Stereo/Bilge Pump Circuit Breakers

Battery System

Never disconnect battery cables when the engine is running. Damage to the electrical system may result.

Depending upon the model, your boat can have one, two, or three batteries associated with it. The battery is used to supply DC power to the boat. All marine batteries provide a high capacity plus cold cranking performance. The batteries are not maintenance free and require periodic maintenance.

- Maintain the water level in the battery cells.
- Keep the terminals clean.
- Keep the case clean.
- Keep the battery charged.

Many variables affect the life of a battery. Some of these are, but not limited to:

- Usage
- Temperature
- Charging
- Age

Always inspect the condition of the battery. When inspecting ***ALWAYS*** utilize proper safety precautions.

A low water level may cause the batteries to fail or possibly explode. Therefore take corrective action immediately. If you must replace one battery, replace them all.

If there is more than one battery on your boat they can be broken down in the following manner:

For two batteries:

- Port start battery
- Starboard start battery

For three batteries:

- Port start battery
- Starboard start battery
- House

The batteries are connect to a battery distribution cluster which support the master battery switches. The number of switches in the cluster will vary depending upon the number of batteries in the boat. Figure 3-32 illustrates a typical two battery switch cluster.

The battery distribution cluster may also contain the Emergency Parallel switch. Activating this switch links all the batteries together to provide extra current should one battery become depleted.

Figure 3-32. Two Battery Switch Cluster

Battery Charging

Each engine has an alternator which charges the battery, or batteries and also provides electrical power to the boat. Some models may also use an external power source (shore power) to keep the battery charged.

A fully automatic AC battery charger (Figure 3-33) is optional on the Launch 22, Launch 25, Launch 28, Corsair 25, and Corsair 28. Depending upon the model and options chosen, your boat may have as many as three chargers installed. The batteries are charged according to battery switch position and power demand (refer to “Battery Powered Systems” on page 44).

The charger(s) is protected by a circuit breaker on the main circuit breaker panel.

A manufacturer’s operation booklet is supplied with the vessel that has this option installed. This booklet contains additional information which you should become familiar with.

Figure 3-33. Optional Battery Charger

Battery Powered Systems

For all models, the bilge pump and stereo memory is wired directly to the battery. Even with all battery switches off, these two items continue to be energized. If the battery is disconnected, then all stereo memory will be lost and you will have to reset your presets.

Table 3-3 will help you identify common components which are energized on each model of boat (battery power engaged, without refrigerator option).

Table 3-3. Battery Powered Systems Matrix

Item	Lancer 20	Launch 22 Lancer 22	Launch 25 Corsair 25	Launch 28 Corsair 28 (Single Engine)	Launch 28 Corsair 28 (Twin Engine)
Bilge Pump (Battery Power ON or OFF)	X	X	X	X	X
Stereo Memory (Battery Power ON or OFF)	X	X	X	X	X
Battery Charger (Battery Power ON or OFF)			X	X	X
CO Monitor (Battery Power ON or OFF)				X (Corsair Only)	X (Corsair Only)
All Helm Components	X	X	X	X	X
Engine Starter	X	X	X	X	X
Amplifier		X	X	X	X
Sump Pump			X		

The refrigerator option adds the HOUSE battery which changes the way the systems are energized. These changes are discussed for each appropriate boat.

Launch 25

Refrigerator option installed:

- The battery switch indicates positions 1, 2, BOTH, or OFF.
- Position 1 draws and charges battery 1 from the engine alternator.
- Position 2 draws and charges battery 2 from the engine alternator.
- Position BOTH draws and charges both batteries from the engine alternator.
- Position OFF only the non-switched items are active and only the battery charger will charge the batteries.

Refrigerator option not installed:

- The battery switch is an ON-OFF type switch with one battery switching all switched items.

Launch 28/Corsair 28 Single Engine Configuration

Refrigerator option installed:

- Adds voltage sensing relay for battery charging purposes.
- House battery is used to switch on the following components:
  - Helm components
  - Refrigerator
  - Amplifier
  - Stereo
- Voltage-sensing relay allows House battery to be charged by batteries 1 and/or 2 as long as they are charged to 13.7 volts.

Refrigerator option not installed:

- The battery switch is an ON-OFF type switch with one battery switching all switched items.

Launch 28/Corsair 28 Twin Engine Configuration

Refrigerator option not installed:

- Two batteries installed: Port Start, Starboard Start.
- The battery switch indicates positions 1, 2, BOTH, or OFF.
- Position 1 draws and charges battery 1 from both engine alternators.
- Position 2 draws and charges battery 2 from both engine alternators.
- Position BOTH draws and charges both batteries from both engine alternators.
- Position OFF only the non-switched items are active and only the battery charger will charge the batteries.

Refrigerator option installed:

- Adds House battery to system.
- Adds voltage sensing relay for battery charging purposes.
- House battery is used to switch on the following components:
  - Helm components
  - Amplifier
  - Stereo
- Voltage-sensing relay allows House battery to be charged by batteries 1 and/or 2 as long as they are charged to 13.7 volts.

Wiring Color Codes

Color codes identify wiring throughout the boat. The color codes for the DC system is as follows:

- Red – Source Conductors
  - Positive 12VDC. All current carrying conductors between the batteries and first switch or load device in a circuit. Bus bars, circuit breakers, terminals, and fuses in the source conductor are not considered switches or load devices.
- Yellow – Negative Conductors
  - All current carrying DC negatives that terminate at the batteries or their terminals.
- White – Load Conductors
  - Positive 12VDC. Any and all current carrying conductors between the first switch or load device, and the last load device before the negative conductor.
- Green – All Ground Conductors
  - Non-current carrying grounding and bonding conductors.

There are several additional basic colors and color combinations for different circuits used beyond the ignition switch. Some of these colors can serve more than one type of circuit. Table 3-4 illustrates the color codes for the engine compartment and battery wiring.

Table 3-4. Engine/Battery Wire Codes

Function	Wire Color
PORT STARTER	RED
PORT BATTERY	RED
STBD STARTER	RED
HOUR METER	RED
PORT ALTERNATOR	WHITE
STBD BATTERY	RED
STBD ALTERNATOR	WHITE
PORT ENGINE	RED/VIOLET
PORT ENGINE TEMPERATURE	TAN
PORT ENGINE ALARM	TAN/BLUE
PORT ENGINE TACHOMETER	GRAY
PORT ENGINE OIL PRESSURE	LIGHT BLUE
PORT ENGINE TRIM LEVEL	BROWN/WHITE
PORT ENGINE IGNITION	VIOLET
PORT ENGINE STARTER	YELLOW/RED
GEN BATTERY ISOLATED	RED
STBD BATTERY ISOLATED	RED
PORT BATTERY ISOLETED	RED
PORT BATTERY CHARGER	RED (RED)
GEN BATTERY CHARGER	RED (BLUE)
STBD BATTERY CHARGER	RED (GREEN)
THRUSTER BATTERY CHARGER	RED
CABIN 12V OUTLET	RED
PORT SHUTDOWN	WHITE/RED

Table 3-4. Engine/Battery Wire Codes (Continued)

Function	Wire Color
STBD SHUTDOWN	WHITE/GREEN
STBD ENGINE	RED/VIOLET
STBD ENGINE TEMPERATURE	TAN
STBD ENGINE ALARM	TAN/BLUE
STBD ENGINE TACHOMETER	GRAY
STBD ENGINE OIL PRESSURE	LIGHT BLUE
STBD ENGINE TRIM LEVEL	BROWN/WHITE
STBD ENGINE IGNITION	VIOLET
STBD ENGINE STARTER	YELLOW/RED
GENERATOR STOP POWER	RED/WHITE
GENERATOR STOP	WHITE/RED
GENERATOR POWER	RED/VIOLET
GENERATOR PRE-HEAT	WHITE
GENERATOR START	YELLOW/RED
PORT PARALLEL START	RED
STBD PARALLEL START	RED
BOW THRUSTER POWER	RED
BOW THRUSTER BATTERY	RED
BOW THRUSTER LEFT	WHITE/RED
BOW THRUSTER RIGHT	WHITE/GREEN
PORT SHUTDOWN PWR	RED/WHITE
PORT SHUTDOWN	WHITE/RED
STBD SHUTDOWN PWR	GREEN
STBD SHUTDOWN	WHITE/GREEN
HELM POWER	RED
MAN BILGE SWITCH POWER	RED
HELM SWITCH POWER	RED
GENERATOR STARTER	RED
GENERATOR BATTERY	RED
ELECTRONICS POWER	RED
SHIP'S SERVICE	RED
HATCH SOLENOID	RED
WINDLASS	RED
WINDLASS CONTROL UP	RED/BLUE
WINDLASS CONTROL DOWN	RED/GREEN

DC System Troubleshooting

CAUTION

Disconnect battery cables before performing all inspections, checks, troubleshooting, and repairs to avoid possible personal injury and damage to equipment.

Table 3-5. DC Electrical Troubleshooting Chart

Problem	Cause	Solution
No power to 12V equipment	Battery disconnect switch to OFF	Turn switch ON
	Battery selector switch turned to OFF	Switch selector switch ON for port (1) or starboard (2) battery.
	Weak or dead battery	Recharge battery. Replace if necessary.
Engine running, battery not charging	Engine alternator belt loose	Tighten belt.
Battery not holding a charge	Bad battery	Replace battery
12V device not working	Circuit breaker for device is OFF	Switch breaker to ON.
	Weak or dead battery	Change battery selection switch position (if available); charge battery.
	Faulty electrical connection	Check 12V connections. Tighten or repair as needed.

AC Electrical System

The AC electrical system is an option and not available on all models. It is your responsibility to familiarize yourself with the operation of the AC system.

The AC system operates on a standard 30 amp 120 volt, 60 hertz shore power system. Dockside power service is available in 110 volt (North America) or 220 volt (European).

A receptacle at the stern of the boat allows for connection of the shore power cord. Shore power allows the battery chargers to operate and charge the batteries. A circuit breaker protects the shore power circuit from overload.

Reverse Polarity

Reverse polarity refers to the reversal of the ungrounded current carrying conductor and the grounded current carrying conductor. The shore breaker automatically senses a reverse polarity shore power connection and trips the breaker. **Never** ignore a reverse polarity indication. Ensure polarity is correct when connecting to shore power.

If a reverse polarity occurs:

1. Turn OFF the dock main shore power.
2. Verify the shore power cord is correctly seated and locked in place. Perform this step both on the vessel and at the dock connection.
3. After verifying shore power cord is firmly seated, turn the dock main breaker back on.
4. If the reverse polarity situation still exist, disconnect the power cord and have the dock master check the wiring at the shore power receptacle.
5. If the wiring at the shore power receptacle is correct, and a reverse polarity situation still exists, contact a qualified marine technician.

Connecting and Disconnecting Shore Power

To minimize shock and fire hazards:

- **Turn off the boat's shore connection switch before connecting or disconnecting shore cable.**
- **Connect shore power cable at the boat first.**
- **If a reverse polarity warning indicator is activated, secure dock power and remove power cable.**
- **Disconnect shore power cable at shore outlet first.**
- **Close shore power inlet cover tightly.**
- **Do not alter shore power cable connectors.**

NOTICE

Exceeding 30 amps on one power cord will cause the main breaker(s) to trip. Reduce power load before resetting any breakers.

Never operate the shore power system at less than 105 volts.

This procedure connects shore power to a marina dock system. To connect shore power:

1. Turn off all breakers at the dock station.
2. Attach the power cord to the boat receptacle and lock in place. For safety reasons do not attach the power cord to the dock first.
3. Plug in the cord at the dock station. Turn on dock station breakers.
4. Check for a reverse polarity indication. If a reverse polarity light illuminates, turn off dock power immediately. Refer to the Reverse Polarity section for corrective action.
5. Turn on the boats main AC breaker.
6. Turn on any boat systems desired, do not exceed 30 amps.

To disconnect from shore power:

1. Turn off all breakers at the dock station.
2. Turn off the boats AC main circuit breaker.
3. Disconnect the power cord from the dock station.
4. Disconnect the power cord from the boat.
5. Retrieve and store the power cord.
6. Secure the power receptacle on the boat with the waterproof cap(s).

AC Wiring Codes

Color codes identify wiring throughout the boat. The color codes for the AC system is as follows:

- Red – Source Conductors
  - Positive. All current carrying conductors between the batteries and first switch or load device in a circuit. Bus bars, circuit breakers, terminals, and fuses in the source conductor are not considered switches or load devices.
- Yellow – Negative Conductors
  - All current carrying AC negatives that terminate at their terminals.
- White – Load Conductors
  - Positive. Any and all current carrying conductors between the first switch or load device, and the last load device before the negative conductor.
- Green – All Ground Conductors
  - Non-current carrying grounding and bonding conductors.

There are several additional basic colors and color combinations for different circuits used beyond the ignition switch. Some of these colors can serve more than one type of circuit.

Troubleshooting the AC System

Table 3-6. AC Electrical Troubleshooting Chart

Problem	Cause	Solution
No AC power	Main breaker(s) tripped of OFF	Turn breakers ON or reset.
	Breaker(s) at main AC panel tripped or OFF	Turn breakers ON or reset.
	Shore power cord not securely connected	Check cord; plug in if necessary.
	Loose or disconnected wire(s)	Tighten connections, or refer to qualified marine electrician.
No power to AC devices	Breaker(s) at main AC panel tripped or OFF	Turn breakers ON or reset.
	Shore power cord not connected	Check cord; plug in if necessary.
	Loose or disconnected wire(s)	Tighten connections, or refer to qualified marine electrician.
	Ground fault interrupter tripped	Reset button on outlet and test.

Compass

The compass is installed on each boat to aid in navigation. A magnetic compass is often deflected by iron, magnets, or electrical current from nearby wiring. The compass must adjusted to compensate for these influences.

Only a qualified technician should perform compass adjusting/compensation. Since it is seldom possible to correct compass deviation to zero, a deviation card is created to indicate the correct heading that must be utilized when navigating by compass. Keep this card near the helm and refer to it as necessary.

The actual size and location of the compass varies from model to model.

Figure 3-34. Compass

Entertainment and Convenience Equipment

Entertainment equipment consists of a standard in-dash AM/FM stereo CD with speakers and an in-dash remote control. All models have four speakers except the Lancer 20 which has only two. An optional sound package includes additional speakers, amplifier, and transom remote controls. The entire system is designed to be waterproof to endure the harsh elements of boating. Included with the boat is an instruction manual that details the proper use and care of the system.

The refrigeration system consists of a 12VDC cold plate with adjustable thermostat. When working on DC power the engine must be running to prevent the batteries from being depleted. An instruction manual details the proper use and care of the system.

Convenience equipment varies from model to model and includes storage coolers, drink holders, wet bar, sink, and refrigerator.

CHAPTER 4

Storage and Commissioning

In climates where freezing occurs, it is important to prepare the boat for storage. This procedure is called winterizing.

Winterizing is the procedure of removing all water from the boat that might otherwise freeze and damage plumbing and components. In those areas where water cannot be removed, anti-freeze is added to prevent freezing and damage.

The procedures in this chapter are general in nature and not all inclusive. Additionally you must consult individual component manuals for instructions on how to winterize any specific component.

Winter Storage

When you prepare your boat for winter storage, you should also prepare the trailer.

General

_____ Completely wash and wax the boat, both inside and out. Remove all marine growth and scum.

_____ Inspect all sections of the boat for damage and paint wear.

_____ Inspect all underwater gear, including propellers for wear and/or damage.

_____ Remove cushions and other fabric-type items and store in a clean, dry area. For those items that cannot be removed leave a chemical dehumidifier or mildew inhibitor under the cover.

_____ Clean and store all PFDs in a clean, dry environment.

_____ Clean all cupboards, cabinets, and drawers with mild soap and water. Dry completely. Remove any item that may cause mildew.

_____ Lubricate all hatch and locker hinges. Leave open if possible.

_____ Remove all electronics and store in a dry, secure area.

_____ Store the boat in a bow high attitude.

_____ Drain and dry all sections of the bilge. Remove all drain plugs and store in a plastic bag. Secure plug(s) to the throttle level.

_____ Position the cover to prevent the pooling of water.

_____ Ventilate to prevent mildew and allow air flow.

_____ Slacken tiedowns to reduce strain on the hull.

_____ Inspect the boat regularly during storage.

Fresh Water Systems

_____ Turn on the pressure water pump, open all faucets and drain the system completely. Leave all faucets open. Ensure the storage tank is completely empty.

It is not recommended that you leave water in the fresh water system. If you choose to leave water in the fresh water system during winter storage you must add non-toxic antifreeze. Winterize in accordance with the following steps.

_____ Fill the water tank with a solution of fresh water and non-toxic antifreeze.

_____ Open the faucet furthest away from the water pump. Energize the water pump and run until antifreeze solution flows from the faucet.

_____ Open other faucets and run until antifreeze solution appears. Close all faucets.

_____ Disengage water pump breaker.

Engines and Fuel Tank

_____ Refer to the engine owner's manual for detailed winterization instructions.

_____ Gasoline Engines – Fill tank and add a gas stabilizer and conditioner.

_____ Diesel Engines – Fill tank and add biocide and/or petroleum distillate additive.

Batteries

_____ Remove the batteries from the boat and clean both batteries and battery terminals.

_____ Properly store batteries in a cool, dry place. Do not store on concrete.

_____ Place on a regulated trickle charge.

Marine Sanitation Device

_____ Prepare in accordance with manufacturer's directions.

Trailer

_____ Repack all wheel bearings.

_____ Inspect tires for wear. Replace as required.

_____ Inspect and lubricate hitch coupler, rollers, tongue jack, and winch.

_____ Inspect lights and electrical system. Inspect for corrosion, loose bulbs, and frayed wires.

_____ Inspect all tiedowns for frays and wear.

_____ Inspect for metal fatigue, corrosion, and cracks. Repair as necessary.

_____ Inspect for and replace any worn rollers and bunks.

Spring Commissioning

General

_____ Clean all sections of the boat as necessary.

_____ Inspect all thru-hull openings. Ensure they are clean and open.

_____ Check running gear. Replace propellers if removed.

_____ Check all life saving gear. Replace as necessary.

_____ Cycle all seacocks and valves to ensure proper and free movement. Leave open appropriate valves. Check hoses and clamps. Re-install all drain plugs.

_____ Inspect the electrical system completely.

_____ Inspect navigation lights and check for proper operation.

_____ Check all switches for proper operation.

_____ Ensure engine compartment blower is operating properly. Make sure exhaust vent(s) are not obstructed.

_____ Inspect, and if necessary replace, anchor lines and gear.

Fuel System

_____ Thoroughly check each fitting and hose in the fuel system. Ensure it is fuel and vapor tight.

_____ Open any valves closed for winterization.

Engines

_____ Refer to the engine owner's manual for detailed recommissioning instructions.

_____ Ensure fluids are at proper levels.

Batteries

_____ Ensure batteries are clean and corrosion-free before installing.

_____ Ensure batteries are properly secured in their mounts.

Fresh Water Systems

_____ Connect any water lines that may have been removed or disconnected.

_____ Energize pressure pump and check for leaks.

_____ Sanitize the system. Flush the system completely. If necessary drain and re-flush. Ensure all contaminants are removed from the system.

Fresh Water Systems (Continued)

_____ Bleed all air from the system.

_____ Close all faucets as required.

Bilge Pumps

_____ Check bilge pump operation in both automatic and manual mode.

APPENDIX A

Warranty Information

CHRIS-CRAFT LIMITED WARRANTY

This document is your Warranty Registration Certificate and Statement of Warranty.

WHAT IS COVERED: This Limited Warranty applies to Chris-Craft boats and yachts beginning with model year 2007.

TEN YEAR LIMITED STRUCTURAL HULL AND DECK WARRANTY: Chris-Craft warrants to the original retail purchaser of this boat if purchased from an authorized Chris-Craft dealer that the selling dealer or Chris-Craft will repair or replace the fiberglass hull and deck, including stringers, floor, motor mounts, and transom for a period of ten (10) years from the date of in-service delivery if it is found to be structurally defective in material or workmanship. This limited warranty is subject to all limitations and conditions explained below.

TWO YEAR LIMITED WARRANTY: Chris-Craft warrants to the original retail purchaser of this boat if purchased from an authorized Chris-Craft dealer that the selling dealer or Chris-Craft will repair or replace any:

- Upholstery defects in factory materials or workmanship within two (2) years of the date of delivery. This limited warranty is subject to all limitations and conditions explained below.

ONE YEAR LIMITED WARRANTY: Chris-Craft warrants to the original purchaser of this boat if purchased from an authorized Chris-Craft dealer that the selling dealer or Chris-Craft will repair or replace any:

- Gelcoat surface of the hull or deck that has laminate blisters, crazing, air voids or stress cracks which occurred as a result of defects in factory material and workmanship within two (2) years of the date of delivery, provided that the original factory gel coat surface has not been altered in any way such as accident repair, application of a coating other than marine bottom paint or from improper surface preparation for paint, (i.e., excessive sanding or sandblasting, etc.), any of which will void this warranty. This limited warranty is subject to all limitations and conditions explained below.
- any parts not already covered by other warranties that are found to be defective in factory materials or workmanship for a period of one (1) year from the date of delivery, subject to all exceptions, limitations and conditions contained herein.

All warranty work is to be performed at a Chris-Craft dealership or other location authorized by a Chris-Craft Customer Service Manager after it is established to Chris-Craft's satisfaction that there is a defect in material or workmanship.

CUSTOMER OBLIGATIONS: The following are conditions precedent to the availability of any benefits under these limited warranties:

(a) The purchaser must sign and submit to Chris-Craft the "OWNER REGISTRATION AND SYSTEMS CHECKLIST FORM within ten (10) days of the date of delivery.

(b) The purchaser must first notify the dealer from whom the boat was purchased of any claim under this warranty within the applicable warranty period and within a reasonable period of time (not to exceed thirty (30) days) after the defect is or should have been discovered.

(c) Chris-Craft will not be responsible to repair any condition or replace any part, (1) if the use of the boat is continued after the defect is or should have been discovered; and (2) if such continued use causes other or additional damage to the boat or component parts of the boat.

(d) Based on the dealer's knowledge of the Chris-Craft warranty policy and/or consultations with Chris-Craft, the dealer will accept the claim and arrange for appropriate repairs to be performed, or deny the claim if it is not within the warranty.

(e) The dealer will contact the Chris-Craft boat owner regarding instructions for delivery of boat or part for warranty repair if it is covered by the limited warranty. All costs to transport the boat for repairs are the responsibility of the owner.

(f) If the Chris-Craft boat owner believes a claim has been denied in error or the dealer has performed the warranty work in an unsatisfactory manner, the owner must notify the Chris-Craft Customer Service Department in writing within thirty (30) days of the repair attempt at the address listed for further consideration. Chris-Craft will then review the claim and take appropriate follow-up action.

WARRANTY EXCEPTIONS: THIS LIMITED WARRANTY does not cover the following:

(a) Engines and power train, which come with their own warranty, metal plating or finishes, windshield breakage, and leakage due to seal shrinkage or wear and tear; fading and deterioration of paints, timber, canvas, vinyl, upholstery and fabrics;

(b) Gelcoat surfaces including, but not limited to, fading, chalking, osmotic blistering as a result of environmental conditions, or discoloration except as noted above;

(c) Accessories and items which were not part of the boat when shipped from the Chris-Craft factory, and/or any damage caused thereby;

(d) Damage caused by misuse, accident, galvanic corrosion, negligence, lack of proper maintenance, or improper trailering;

(e) Any boat used for racing, or used for rental or commercial purposes;

(f) Any boat operated contrary to any instructions furnished by Chris-Craft, or operated in violation of any federal, state, Coast Guard or other governmental agency laws, rules, or regulations;

(g) The limited warranty is void if unauthorized alterations have been made to the boat;

(h) Transportation of boat or parts to and/or from the CHRIS-CRAFT factory or service location;

(i) Travel time or haul outs, loss of time or inconvenience;

(j) Any published or announced performance characteristics of speed, fuel and oil consumption, and static or dynamic transportation in the water;

(k) Any boat that has been repowered beyond Chris-Craft power recommendations;

(l) Water damage to, dry rot to, condensation to, or absorption by interior surfaces, wood structures or polyurethane foam; interior wood including, but not limited to, bleeding and/or discoloration as a result of condensation or moisture or water continually contacting the plywood causing staining to upholstery, carpet or other interior surfaces;

TRANSFERABILITY

The unexpired term of this limited warranty may be transferred once to a subsequent new owner, provided that the transfer occurs during the first two (2) years after the date of in-service delivery. The new owner must register the transfer of limited warranty within 60 days of purchase, by sending a written request to CHRIS-CRAFT, 8161 Fifteenth Street, East. Sarasota, FL 34243 USA and accompanied by the payment to CHRIS-CRAFT of two hundred dollars ($200.00).

ADDITIONAL TERMS, CONDITIONS, DISCLAIMERS AND ARBITRATION CLAUSE

NO WAIVER OF THESE TERMS: The terms, conditions, limitations and disclaimers contained herein cannot be waived except by the Customer Service Manager of Chris-Craft. Any such waiver shall be in writing. Neither the dealer, nor the customer, nor any service, sales and/or warranty representative of Chris-Craft is authorized to waive and/or modify these conditions, limitations and/or disclaimers.

DISCLAIMER OF IMPLIED WARRANTIES AND EXCLUSIONS OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

GENERAL PROVISIONS: ALL GENERAL, SPECIAL, INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM THIS WARRANTY AND ARE TOTALLY DISCLAIMED BY CHRIS-CRAFT. IT IS THE INTEREST OF THE PARTIES THAT THE OWNER'S SOLE AND EXCLUSIVE REMEDY IS THE REPAIR OR REPLACEMENT OF THE VESSEL OR ITS ALLEGEDLY DEFECTIVE COMPONENT PARTS AND THAT NO OTHER LEGAL OR EQUITABLE REMEDIES SHALL BE AVAILABLE TO SAID OWNER. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES MAY NOT APPLY TO YOU. THIS IS A LIMITED WARRANTY; CHRIS-CRAFT MAKES NO WARRANTY, OTHER THAN CONTAINED HEREIN; TO THE EXTENT ALLOWED BY LAW ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARISING IN STATE LAW ARE EXPRESSLY EXCLUDED TO THE EXTENT ALLOWED BY LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. ALL OBLIGATIONS OF CHRIS-CRAFT ARE SPECIFICALLY SET FORTH HEREIN. CHRIS-CRAFT DOES NOT AUTHORIZE ANY PERSON OR DEALER TO ASSUME ANY LIABILITY IN CONNECTION WITH CHRIS-CRAFT BOATS. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Chris-Craft's obligation with respect to this warranty is limited to making repairs to or replacing the defective parts and no claim for breach of warranty shall be cause for cancellation or rescission of the contract or sale for any boat manufactured by Chris-Craft.

Chris-Craft will discharge its obligations under this warranty as rapidly as possible, but cannot guarantee any specific completion date due to the different nature of claims which may be made and services which may be required. Chris-Craft reserves the right to change or improve the design of its boats without obligation to modify any boat previously manufactured. This limited warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. Chris-Craft shall in no way be responsible for any repairs not PRE-AUTHORIZED by a Chris-Craft Customer Service Manager or repairs performed by a repair shop not PRE-AUTHORIZED by a Chris-Craft Customer Service Manager.

ARBITRATION OF DISPUTES AND WAIVER OF JURY TRIAL

EXCEPT AS SPECIFICALLY EXCLUDED IN THIS LIMITED WARRANTY, PURCHASER, CHRIS-CRAFT AND DEALER AGREE TO SUBMIT ANY AND ALL CONTROVERSIES, CLAIMS OR DISPUTES ARISING OUT OF OR RELATING TO THE BOAT AND THIS LIMITED WARRANTY AND ALL OTHER AGREEMENTS EXECUTED BY PURCHASER RELATED TO THE BOAT **TO BINDING ARBITRATION**. IT IS THE EXPRESS INTENT OF PURCHASER, CHRIS-CRAFT AND DEALER THAT THIS ARBITRATION PROVISION APPLIES TO ALL DISPUTES, INCLUDING CONTRACT DISPUTES, TORT CLAIMS, FRAUD CLAIMS AND FRAUD-IN THE-INDUCEMENT CLAIMS, STATUTORY CLAIMS AND REGULATORY CLAIMS RELATING IN ANY MANNER TO THE BOAT AND THIS LIMITED WARRANTY. IF ANY CONTROVERSY OR CLAIM DESCRIBED IN THIS ARBITRATION PROVISION IS DETERMINED FOR ANY REASON TO BE INELIGIBLE FOR ARBITRATION, AND FOR ANY CONTROVERSIES, CLAIMS, OR DISPUTES SPECIFICALLY EXEMPTED FROM ARBITRATION, THEN THOSE CONTROVERSIES, CLAIMS OR DISPUTES SHALL INSTEAD BE DECIDED BY A JUDGE OF A COURT OF COMPETENT JURISDICTION, **WITHOUT A JURY**. PURCHASER, CHRIS-CRAFT AND DEALER KNOWINGLY AND VOLUNTARILY WAIVE THE RIGHT TO A TRIAL BY JURY FOR ALL SUCH CONTROVERSIES, CLAIMS AND DISPUTES. PURCHASER, CHRIS-CRAFT AND DEALER UNDERSTAND THAT THERE SHALL BE NO JURY TRIAL, WHETHER THE CONTROVERSY OR CLAIM IS DECIDED BY ARBITRATION OR BY TRIAL BEFORE A JUDGE. NOTWITHSTANDING THE PROVISIONS OF THIS ARBITRATION AGREEMENT, WITH REGARD TO CONTROVERSIES AND/OR ENTITLEMENT TO POSSESSION OF EITHER THE BOAT OR ANY TRADE-IN, ANY PARTY HERETO MAY RESORT TO A JUDICIAL DETERMINATION (BY A JUDGE AND NOT A JURY), OF SUCH CONTROVERSIES, DISPUTES OR CLAIMS WITHOUT WAIVING ANY RIGHT TO DEMAND ARBITRATION WITH RESPECT TO ALL OTHER CONTROVERSIES, DISPUTES OR CLAIMS BETWEEN THE PARTIES AS MORE SPECIFICALLY SET FORTH IN THIS ARBITRATION PROVISION.

ALL ARBITRATIONS SHALL PROCEED THROUGH THE AMERICAN ARBITRATION ASSOCIATION AND BE SUBJECT TO ITS COMMERCIAL ARBITRATION RULES, EXCEPT AS SET FORTH HEREIN. THE ARBITRATORS SHALL HAVE THE AUTHORITY TO AWARD ANY FORM OF RELIEF THAT COULD BE PROPERLY AWARDED IN A CIVIL ACTION IN THE STATE OF FLORIDA FOR THE TYPE OF CLAIMS PRESENTED, SUBJECT HOWEVER, TO ALL LIMITATIONS, PREDICATES, AND CONDITION COVERING SUCH REMEDIES OR RELIEF UNDER FLORIDA LAW. THE PURCHASER, CHRIS-CRAFT OR DEALER MAY DEMAND ARBITRATION OF A CLAIM BY FILING A WRITTEN DEMAND FOR ARBITRATION, ALONG WITH A STATEMENT OF THE MATTER IN CONTROVERSY WITH THE AMERICAN ARBITRATION ASSOCIATION, AND SIMULTANEOUSLY SERVING A COPY UPON THE OTHER PARTY. PURCHASER, CHRIS-CRAFT AND DEALER AGREE THAT THE ARBITRATION PROCEEDING SHALL BE CONDUCTED IN MANATEE COUNTY, FLORIDA UNLESS OTHERWISE AGREED BY THE PARTIES. EACH PARTY AGREES TO BEAR THEIR OWN ATTORNEY FEES AND COSTS. THE FILING FEES FOR THE ARBITRATION SHALL BE PAID BY THE FILING PARTY INITIATING THE ARBITRATION. THE ARBITRATOR'S FEE AND ANY OTHER "COSTS" NORMALLY TAXABLE IN A CIVIL ACTION SHALL BE TAXED BY THE ARBITRATOR IN FAVOR OF THE PREVAILING PARTY.

CHRIS-CRAFT CUSTOMER PROBLEM RESOLUTION

If a customer experiences a problem with a Chris-Craft Product:

They should maintain written record of events (the problem, related conversations/with whom, important dates, etc.), as well as any supporting documents (invoices, work orders, etc.), and take the following steps:

1. Discuss the matter with the appropriate department manager at the dealership (e.g. Service Manager, Parts Manager, etc.). Explain exactly what the problem/cause is and ask what action will be taken to resolve it. The Department Manager may find it necessary to contact Chris-Craft on behalf of the customer in order to find a resolution.

If the matter remains unresolved after a reasonable amount of time:

2. Discuss the matter with the Dealer Principal (usually the owner or co-owner of the dealership). Explain what has occurred including the problem and the subsequent discussion with the Department Manager.

If the matter remains unresolved:

3. Contact the Chris-Craft Customer Service Department at:

   Chris-Craft Corporation
   Customer Service Department
   8161 15th Street East
   Sarasota, FL 34243
   (941) 351-4900
   (941) 358-3782 Fax

TEN YEAR TRANSFERABLE PROTECTION

Hull and Deck Structure: Repair of any structural fiberglass deck or fiberglass hull defect

Please refer to the actual Chris-Craft Limited Warranty for details.

FIVE YEAR TRANSFERABLE PROTECTION

(FOR U.S. RESIDENT CUSTOMERS ONLY, ON UNITS ORDERED BY DEALERS AFTER JULY 1, 2004)

- **Engine:** All Internally lubricated parts Including: pistons, rings and pins, crankshaft and main bearings, connecting rods and rod bearings, oil pump, camshaft and bearings, timing chain, gears and or belt, rocker arms, valve push rods, lifters, valve cover (s), cylinder head and engine block (only if damaged as a result of the failure of an internally lubricated engine component), intake manifold, exhaust manifold (Risers, riser gaskets and pipes are excluded), flywheel, harmonic balancer, oil pan, engine mounts, distributor housing shaft and bearings only, diesel engine turbocharger housing and all internal parts, turbocharger waste gate actuator.
- **Intermediate Housing Components (Stern Drive Only):** Intermediate or adapter housing (if damaged as a result of the failure of a covered component), transom plate, upper gearcase (if damaged as a result of the failure of a covered component), upper gearcase housing (if damaged as a result of the failure of a covered component), U-Joints, U-Joint shaft and bearing, upper steering bearing and gimbal, tilt bearing and lower steering bearings, shift bellcrank, bushing and plug, center yoke; drive yoke.
- **Transmission:** All internally lubricated parts, transmission mounts, oil pan transmission case (if damaged as a result of the failure of a covered component).
- **Gearcase Components (Stern Drive Only):** Bearing and oil retainer (except prop shaft seal) driveshaft and upper bearing, shift rod and/or cover assembly, lower pinion bearing, forward and / or pinion gear, reverse gear, propeller shaft or shift fork, gearcase and gearcase head (if damaged as a result of the failure of a covered component)

- **V-Drive Components:** All internally lubricated parts within the V-drive case. V-drive case (if damaged as a result of the failure of a covered component).
- **Electrical:** Starter, starter solenoid, starter drive voltage regulator, ignition coil, switch box, ignition module, ignition trigger/sensor, windshield wiper motor, wiring and wiring harness.
- **Closed Cooling System:** Engine water coolant circulating pump, oil cooler, heat exchangers.
- **Power Trim and Tilt:** Spring sending unit, oil pump, pump relief valve spring, O-ring, trim cylinder, tilt cylinder, manual release valve, hydraulic pump, reverse lock valve, power tilt motor and power trim motor
- **Controls:** Neutral start switch, starter/choke primer switch, starter /stop button, throttle control handle, throttle cam lever, throttle and shift cable, shift interrupter switch, tilt/trim switch ignition switch (Keys and tumblers excluded)
- **Steering:** Control helm assembly, steering bracket and bushing swivel bracket bearing, control rack and yoke assembly, power steering pump, power steering cylinder, steering wheel coupling, steering cable, steering rams.
- **Fuel System:** Fuel /and/or air injector(s), fuel injection pump, EFI electric control module, fuel delivery pump, diaphragm and flame arrester (Carburetors are excluded)
- **Seals and Gaskets:** Seals and Gaskets are covered for those components covered by the plan.
- Additional Benefits:
  - $150 Towing Allowance
  - $100 Hoist / Haul-Out Allowance
  - $50 Service Call Reimbursement
  - $25 Repair Deductible

Please refer to the actual Pinnacle Plan Provision for full provisions and coverage.

FIVE YEAR TRANSFERABLE PROTECTION

(FOR U.S. RESIDENT CUSTOMERS ONLY, ON UNITS ORDERED BY DEALERS AFTER JULY 1, 2004)

Chris-Craft Packages

Cruiser Package (40 Roamer / 33 & 36 Corsair Only):

- Auxiliary Powerplant/Generator Components:
  - All internally lubricated parts of the powerplant engine plus the starter, switches and generator assembly, seals and gaskets.
- Power Inverter/Converter
- Air Conditioning/Heat Exchange System Components:
  - Compressor, evaporator, capacitors, relays, thermostats, fans, control panel, expansion valve, temperature control programmer, receiver dryer, blower motor, and heating element.
- Fresh Water System Components:
  - Water Pump, compressor; water tank; waterlines traps, fittings, faucets.
- Hot Water System Components:
  - Thermostat, relays, and water heater unit.
- Waste System Components:
  - Shower, toilet, and sink(s), fixtures and traps, holding tanks, gate valves and connections.
- Appliances:
  - Range/ cook top, oven, microwave, refrigerator, ice maker, trash compactor, and central vacuum system.
- 12 Volt/ 24 Volt/ 110 Volt Shore Power Components:
  - Battery charger/ converter, onboard receptacle, shore power main switch, circuit panel, and circuit breakers. (Shore power cables are excluded.)

- Electrical Components:
  - Battery main switch, battery isolator, battery selector switch, remote spotlight (control panel, horizontal/ vertical control motors, light housing), bow and marker lights, and switches. (Light bulbs are excluded.)
- Dual Station/ Tower Control Set Components:
- Helm control, throttle/ shift control box.
- Speedometer & Tachometer Components:
  - Speedometer head, tachometer head, speed log and speed sensor.
- Compass Head.
- Stereo Systems Components:
  - Factory or dealer installed audio system, (excluding speakers).
- Planing/ Trim Tabs. Bilge Components:
  - Pump, manual control panel, blower and switches.
- Gauges:
  - Voltmeter, fuel gauge, trim position gauge, oil pressure gauge, water pressure gauge, engine water temperature gauge.

Sport Package (Lancer 20, 22, 25, 28 Launch & Corsair Only):

- Digital Depth Finder / Fish Finder:
  - Unit, depth warning alarm, transducer, control cable, unit wiring harness and mounting bracket.
- Stereo:
  - Manufacturer installed, in dash CD player, cassette player and AM / FM radio.
- Electrical / Instrument panel:
  - Tachometer head, voltage gauge, speedometer head, speedometer pilot tube, mounting bracket and control cable, battery main switch, battery isolator, battery selector switch, battery box, fuse block, and holders, manual compass, horn, chart light, transom light, bow light, interior courtesy lights, and docking lights (excludes light bulbs); and windshield wiper motor.
- Appliances:
  - Galley sink and faucet, refrigerator/ icebox.
- Bilge Components:
  - Bilge, Control panel switch, blower motor and wiring harness.

Please refer to the actual Pinnacle Plan Provision for the full provisions and coverage.

TWO YEAR TRANSFERABLE PROTECTION

Gelcoat Finish: Repair any gel coat surface that has laminate blisters, air voids, crazing, or stress cracks.

- Upholstery:
  - Repair any upholstery defects in materials or workmanship.

Please refer to the actual Chris-Craft Limited Warranty for details.

ONE YEAR TRANSFERABLE PROTECTION

Chris-Craft Manufactured Parts: Parts to be found defective in factory material or workmanship

Please refer to the actual Chris-Craft Limited Warranty for details.

POWERTRAIN WARRANTY

Any matter involving the powertrain is the responsibility of the powertrain manufacturer or its authorized representative. The powertrain warranty consists of that offered by the manufacturer of the product, or its authorized representative in the specific county, and should be addressed by them.

Powertrain Manufacturers used by Chris-Craft are:

Gasoline (Petrol) Engines:

Volvo Penta
Volvo Penta of the America, Inc.
1300 Volvo Penta Drive
Chesapeake, VA 23320

Telephone: (757) 436-2800

Mercruiser
3003 North Perkins Road
Stillwater, OK 74075

Telephone: (405) 743-6555

Diesel Engines

Volvo Penta
Volvo Penta of the Americas, Inc.
1300 Volvo Penta Drive
Chesapeake, VA 23320

Telephone: (757) 436-2800

Yanmar
Yanmar Diesel America Corp.
951 Corporate Grove Drive
Buffalo Grove, IL 60089-4508

Telephone: (847) 541-1900

Cummins Marine
4500 Leeds Ave. Suite 301
Charleston, SC 29405-8521

Telephone: (843) 745-1170

APPENDIX B

Checklist

To obtain the most pleasure and safety from your boating experience, certain criteria should be followed. A checklist provides a standard which can be used to ensure critical items are accounted for. This appendix provides a set of checklists which you can reproduce and use, as needed, for the task at hand.

SAFETY BOATING CHECKLIST

Boating safety and the safety of your passengers is your responsibility.

_____ Observe the instructions on all safety labels. Failure to heed their warning may result in injury.

_____ Never operate a boat while under the influence of drugs or alcohol. It is a Federal offense. Allow only qualified drivers to operate your boat.

_____ At least one passenger aboard should be able to operate the boat in case the operator/driver is unexpectedly unable to do so.

_____ Do not overload the boat. Heavy seas reduce capacity. A weight capacity plate is not an excuse for failure to use common sense or rational judgement.

_____ Always use the lanyard stop switch when operating the boat and ensure that all passengers are familiar with its use.

_____ Regularly inspect the boat, the hull, engine, safety equipment, and all other boating gear. Keep them in a safe operating condition.

_____ Be sure you have the minimum required safety equipment on board. Add any additional gear needed for your outing.

_____ Ensure that all lifesaving equipment, including fire extinguisher, is in a safe operating condition and easily accessible. Show all passengers where the equipment is located and make sure they know how to use it.

_____ Be very careful when fueling the boat. Know the capacity of the fuel tank. Avoid fueling at night except under well-lit conditions. Gas spills are unnoticeable in the dark. Extinguish all open flames when fueling.

_____ When fueling, ensure the engine compartment is free of gasoline vapors. Inspect all fuel lines for leaks and hose deterioration.

_____ Keep enough fuel on board for the planned cruise. Allow for changes due to adverse weather or other delays. Use 1/3 of the fuel to reach your destination, use 1/3 to return, and keep 1/3 in reserve.

_____ Check local weather conditions before departure. Be alert to changing conditions.

_____ Ensure all charts are up-to-date in your boating area. Before getting underway, check water conditions in the planned cruising area.

_____ Before departure file a Float Plan with a responsible person ashore.

_____ Always operate your boat with consideration, courtesy, and common sense.

VISUAL INSPECTION

Before Launching

Vessel Condition and Equipment – General

_____ Decking – Free of hazards

_____ Safety Equipment – Stowed

_____ Optional/Additional Equipment – As required/desired (properly stowed)

_____ Fire Extinguisher(s) – Accessible, current, and ready to use

_____ Visual Distress Signals – Current, accessible, and properly stowed

_____ PFDs – Accessible and ready to use

_____ Hull – Free of damage, excessive dirt, and marine growth

_____ Propeller(s) – Free of damage, excessive dirt, and marine growth

_____ Drain Plugs – Installed

_____ Outdrive – In correct travel position

_____ Water Tank – Full

_____ Holding Tank (if appropriate) – Empty

Engine Compartment and Fuel System

_____ Engine Compartment Blower – Proper operation

_____ Engine – Oil, power steering, and coolant levels (refer to engine manual)

_____ Engine Cooling Seacocks – Open or as required

_____ Fuel Filters – Clean and clear

_____ Seacocks – As required

_____ Bilge Pumps – Clean/Water-free/Operational

_____ Fuel Fumes – None

_____ Fuel Hoses – Inspect for deterioration, kinks, damage

_____ Fuel Tanks – Full

_____ Extra Fuel – As required/desired (in proper containers and properly stowed)

_____ Batteries – Fully charged and connections tight

_____ Overall Condition – Clean and free of loose objects

PRE-DEPARTURE

_____ Float Plan – Leave with responsible person

_____ Weather Conditions – Safe, within your experience level and capabilities

_____ Weather Report – As needed

_____ Required Documents – On board

_____ Navigation Equipment – On board/as needed, including charts, electronics, etc.

_____ Main Circuit Breakers – Meters and switches as required

_____ Steering System – Operational

_____ Horn – Operational

_____ Electrical System – Operational

_____ Navigation Lights – Operational

_____ Bilge Blower and Bilge Pumps – Operational

_____ Safety Passenger Brief – Complete

_____ Food and Potable Water – As desired/required

TOWING, LAUNCHING, AND RETRIEVAL CHECKLIST

PRE-TOW CHECKLIST

_____ Check trailer tire pressures

_____ Trailer wheel bearings greased

_____ Trailer and tow vehicle lights and brakes – operating

_____ Boat steering mechanism – lubricated

_____ Tiedowns – secured

_____ Winch line – taut

_____ Winch anti-reverse gear – engaged

_____ Motor(s) – in traveling position

_____ Coupler – tight

_____ Hitch ball – lightly greased to reduce friction

_____ Safety chains – properly installed and secured

_____ Tongue jack – raised

_____ Spring bars – adjusted

_____ Boat canvas – down and secured

_____ Boat cover – secured

_____ Boating gear – secured

_____ Registration, proof of insurance, other documentation – present

PRE-LAUNCH CHECKLIST

_____ Drain plugs – installed (first visual check)

_____ Boat cover – removed

_____ Wheel chocks – available

_____ Equipment – loaded for proper trim

_____ Bow and stern lines – fastened

_____ Tiedowns – removed

_____ Fuel tanks – full

_____ Outboard or stern drive – tilted up and engine support removed (if applicable)

_____ Check boat systems (engine room blower, bilge pumps, lights, etc.) – operational

_____ Electrical connection to tow vehicle – unplugged

_____ Trailer wheel bearings – cool

_____ Ramp conditions, water depth, current – checked

_____ Drain plugs – installed (second visual check)

LAUNCHING CHECKLIST

_____ Station someone to help direct.

_____ Back straight down the ramp.

_____ Stop with trailer wheels at waters edge.

_____ Secure tow vehicle with parking brake and wheel chocks.

_____ Station helper to hold bow and stern lines from the ramp.

_____ Tighten winch brake and release anti-reverse lock. Do not disconnect winch cable.

_____ If equipped release tilt latch.

_____ Allow boat to slide off trailer.

_____ Unhook winch cable from bow and rewind or secure trailer.

_____ Pull boat to appropriate location and secure.

_____ Return trailer tilt to horizontal and lock.

_____ Remove chocks and drive tow vehicle and trailer from ramp.

BOAT RETRIEVAL

_____ Tilt the outboard or stern drive(s) up.

_____ Back trailer down ramp and into the water. Do not submerge the trailer too deep.

_____ Secure the tow vehicle with the parking brake and chocks.

_____ Guide the boat onto the trailer. Use bow and stern lines to help.

_____ Hook winch cable to boat bow eye.

_____ Pull boat onto the trailer and temporarily secure the boat.

_____ Remove tow vehicle from ramp and drive to the securing area.

_____ Remove drain plug and drain the bilge.

_____ If in salt water, wash hull and trailer with fresh water as soon as possible.

_____ Inspect the propeller for nicks or damage.

_____ Inspect the hull for damage.

_____ Wipe hull to prevent water spots and to keep the hull clean.

_____ If desired at this time clean the boat and prepare for next outing.

_____ Properly secure the boat for road travel.

_____ Reconnect trailer lights and ensure they are operational.

APPENDIX C

Coast Guard Accident Report

This appendix contains a copy of the Coast Guard Accident Report currently in use. If you are involved in an accident, ensure you verify that you are using the latest form available.

OMB Control No. 1625-0001

U.S. DEPARTMENT OF HOMELAND SECURITY
U.S. COAST GUARD
CG-2692 (Rev. 06-04)

REPORT OF MARINE ACCIDENT, INJURY OR DEATH

RCS No. G-MOA

MISLE NOTIFICATION NUMBER

SECTION I. GENERAL INFORMATION

1. Name of Vessel or Facility	2. Official No.	3. Nationality	4. Call Sign	5. USCG Certificate of Inspection issued at:

6. Type *(Towing, Freight, Fish, Drill, etc.)*	7. Length	8. Gross Tons	9. Year Built	10. Propulsion *(Steam, diesel, gas, turbine...)*

11. Hull Material *(Steel, Wood...)*	12. Draft *(Ft. - in.)* FWD	AFT.	13. If Vessel Classed, By Whom: *(ABS, LLOYDS, DNV, BV, etc.)*	14. Date *(of occurrence)*	15. TIME *(Local)*

16. Location *(See Instruction No. 10A)*

17. Estimated Loss of Damage TO:
VESSEL _____
CARGO _____
OTHER _____

18. Name, Address & Telephone No. of Operating Co.

19. Name of Master or Person in Charge	USCG License	20. Name of Pilot	USCG License	State License
	☐ YES ☐ NO		☐ YES ☐ NO	☐ YES ☐ NO

19a. Street Address *(City, State, Zip Code)*	19b. Telephone Number	20a. Street Address *(City, State, Zip Code)*	20b. Telephone Number

21. Casualty Elements *(Check as many as needed and explain in Block 44.)*

- NO. OF PERSONS ON BOARD _____
- ☐ DEATH - HOW MANY? _____
- ☐ MISSING - HOW MANY? _____
- ☐ INJURED - HOW MANY? _____
- ☐ HAZARDOUS MATERIAL RELEASED OR INVOLVED *(Identify Substance and amount in Block 44.)*
- ☐ OIL SPILL - ESTIMATE AMOUNT: _____
- ☐ CARGO CONTAINER LOST/DAMAGED
- ☐ COLLISION *(Identify other vessel or object in Block 44.)*
- ☐ GROUNDING ☐ WAKE DAMAGE
- ☐ FLOODING; SWAMPING WITHOUT SINKING
- ☐ CAPSIZING *(with or without sinking)*
- ☐ FOUNDERING OR SINKING
- ☐ HEAVY WEATHER DAMAGE
- ☐ FIRE
- ☐ EXPLOSION
- ☐ COMMERCIAL DIVING CASUALTY
- ☐ ICE DAMAGE
- ☐ DAMAGE TO AIDS TO NAVIGATION
- ☐ STEERING FAILURE
- ☐ MACHINERY OR EQUIPMENT FAILURE
- ☐ ELECTRICAL FAILURE
- ☐ STRUCTURAL FAILURE
- ☐ FIREFIGHTING OR EMERGENCY EQUIPMENT FAILED OR INADEQUATE *(Describe in Block 44.)*
- ☐ LIFESAVING EQUIPMENT FAILED OR INADEQUATE *(Describe in Block 44.)*
- ☐ BLOW OUT *(Petroleum exporation/production)*
- ☐ ALCOHOL INVOLVEMENT *(Describe in Block 44.)*
- ☐ DRUG INVOLVEMENT *(Describe in Block 44.)*
- ☐ OTHER *(Specify)* _____

22. Conditions

A. Sea or River Conditions *(wave height, river stage, etc.)*

B. WEATHER
- ☐ CLEAR
- ☐ RAIN
- ☐ SNOW
- ☐ FOG
- ☐ OTHER *(Specify)* _____

C. TIME
- ☐ DAYLIGHT
- ☐ TWILIGHT
- ☐ NIGHT

D. VISIBILITY
- ☐ GOOD
- ☐ FAIR
- ☐ POOR

E. DISTANCE *(miles of visibility)* _____

F. AIR TEMPERATURE (F) _____

G. WIND SPEED & DIRECTION _____ _____

H. CURRENT SPEED & DIRECTION _____ _____

23. Navigation Information		24. Last Port Where Bound	24a. Time and Date of Departure
☐ MOORED, DOCKED OR FIXED ☐ ANCHORED ☐ UNDERWAY OR DRIFTING	SPEED _____ AND COURSE _____		

25. FOR TtowING ONLY	25a. NUMBER OF VESSELS TOWED	Empty	Loaded	Total	25b. TOTAL H.P. OF TOWING UNITS	25c. MAXIMUM SIZE OF TOW WITH TOW-BOAT(S)	Length	Width	25d. *(Describe in Block 44.)*
									☐ PUSHING AHEAD ☐ TOWING ASTERN ☐ TOWING ALONGSIDE ☐ MORE THAN ONE TOW-BOAT ON TOW

SECTION II. BARGE INFORMATION

26. Name	26a. Official Number	26b. Type	26c. Length	26d. Gross Tons	26e. USCG Certificate of Inspection Issued at:

26f. Year Built	26g. ☐ SINGLE SKIN ☐ DOUBLE	26h. Draft FWD	AFT	26i. Operating Company

26j. Damage Amount	26k. Describe Damage to Barge
BARGE _____ CARGO _____ OTHER _____	

PREVIOUS EDITION IS OBSOLETE

Reset

SECTION III. PERSONNEL ACCIDENT INFORMATION

27. Person Involved
☐ MALE or ☐ FEMALE
☐ DEAD ☐ INJURED
☐ MISSING

27a. Name *(Last, First, Middle Name)*

27b. Address *(City, State, Zip Code)*

27c. Status
☐ Crew
☐ Passenger
☐ Other

28. Birth Date

29. Telephone No.

30. Job Position

31. *(Check here if off duty)* ☐

32. Employer - *(if different from Block 18., fill in Name, Address, Telephone No.)*

33. Person's Time

	YEAR(S)	MONTH(S)
A. IN THIS INDUSTRY -		
B. WITH THIS COMPANY -		
C. IN PRESENT JOB OR POSITION -		
D. ON PRESENT VESSEL/FACILITY -		
E. HOURS ON DUTY WHEN ACCIDENT OCCURRED -		

34. Industry of Employer *(Towing, Fishing, Shipping, Crew Supply, Drilling, etc.)*

35. Was the Injured Person Incapacitated 72 Hours or More?

36. Date of Death

37. Activity of Person at Time of Accident

38. Specific Location of Accident on Vessel/Facility

39. Type of Accident *(Fall, Caught between, etc.)*

40. Resulting Injury *(Cut, Bruise, Fracture, Burn, etc.)*

41. Part of Body Injured

42. Equipment Involved in Accident

43. Specific Object, Part of the Equipment in block 42., or Substance *(Chemical, Solvent, etc.)* that directly produced the Injury.

SECTION IV. DESCRIPTION OF CASUALTY

44. Describe how accident occured, damage, information on alcohol/drug involvement and recommendations for corrective safety measures. *(See instructions and attach additional sheets if necessary).*

45. Witness *(Name, Address, Telephone No.)*

46. Witness *(Name, Address, Telephone No.)*

SECTION V. PERSON MAKING THIS REPORT

47. Name (PRINT) *(Last, First, Middle)*

47a. Signature

47b. Address *(City, State, Zip Code)*

47c. Title

47d. Telephone No.

47e. Date

FOR COAST GUARD USE ONLY

REPORTING OFFICE:

MISLE Incident Investigation Activity Data Entry:

MISLE Incident Investigation Activity Number (if applicable)

☐ NONE ☐ PRELIMINARY ☐ DATA COLLECTION ☐ INFORMAL ☐ FORMAL

Serious Marine Incident ☐ Yes ☐ No Major Marine Casualty ☐ Yes ☐ No	INVESTIGATOR *(Name)*	DATE	APPROVED BY *(Name)*	DATE

Reset

INSTRUCTIONS

FOR COMPLETION OF FORM CG-2692

REPORT OF MARINE ACCIDENT, INJURY OR DEATH

AND FORM CG-2692A, BARGE ADDENDUM

WHEN TO USE THIS FORM

1. This form satisfies the requirements for written reports of accidents found in the Code of Federal Regulations for vessels, Outer Continental Shelf (OCS) facilities, mobile offshore drilling units (MODUs), and diving. The kinds of accidents that must be reported are described in the following instructions.

VESSELS

2. A vessel accident must be reported if it occurs upon the navigable waters of the U.S., its territories or possessions; or whenever an accident involves a U.S. vessel; wherever the accident may occur. (Public vessels and recreational vessels are excepted from these reporting requirements.) The accident must also involve one of the following (ref. 46 CFR 4.05-1):

A. All accidental groundings and any intentional grounding which also meets any of the other reporting criteria or creates a hazard to navigation, the environment, or the safety of the vessel;

B. Loss of main propulsion or primary steering, or an associated component or control system, the loss of which causes a reduction of the maneuvering capabilities of the vessel. Loss means that systems, component parts, subsystems, or control systems do not perform the specified or required function;

C. An occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route including but not limited to fire, flooding, failure or damage to fixed fire extinguishing systems, lifesaving equipment or bilge pumping systems;

D. Loss of life;

E. An injury that requires professional medical treatment (beyond first aid) and, if a crewmember on a commercial vessel, that renders the individual unfit to perform routine duties.

F. An occurrence not meeting any of the above criteria but resulting in damage to property in excess of $25,000. Damage cost includes the cost of labor and material to restore the property to the condition which existed prior to the casualty, but it does not include the cost of salvage, cleaning, gas freeing, drydocking or demurrage.

MOBILE OFFSHORE DRILLING UNITS

3. MODUs are vessels and are required to report an accident that results in any of the events listed by Instruction 2-A through 2-F for vessels. (Ref. 46 CFR 4.05-1, 46 CFR 109.411)

OCS FACILITIES

4. All OCS facilities (except mobile offshore drilling units) engaged in mineral exploration, development or production activities on the Outer Continental Shelf of the U.S. are required by 33 CFR 146.30 to report accidents resulting in:

A. Death;

B. Injury to 5 or more persons in a single incident;

C. Injury causing any person to be incapacitated for more than 72 hours;

D. Damage affecting the usefullness of primary lifesaving or firefighting equipment;

E. Damage to the facility in excess of $25,000 resulting from a collision by a vessel;

F. Damage to a floating OCS facility in excess of $25,000.

5. Foreign vessels engaged in mineral exploration, development or production on the U. S. Outer Continental Shelf, other than vessels already required to report by Instructions 2 and 3 above, are required by 33 CFR 146.303 to report casualties that result in any of the following:

A. Death;

B. Injury to 5 or more persons in a single incident;

C. Injury causing any person to be incapacitated for more than 72 hours.

DIVING

6. Diving casualties include injury or death that occurs while using underwater breathing apparatus while diving from a vessel or OCS facility.

A. COMMERCIAL DIVING. A dive is considered commercial if it is for commercial purposes from a vessel required to have a Coast Guard certificate of inspection, from an OCS facility or in its related safety zone or in a related activity, at a deepwater port or in its safety zone. Casualties that occur during commercial dives are covered by 46 CFR 197.486 if they result in:

1. Loss of life;
2. Injury causing incapacitation over 72 hours;
3. Injury requiring hospitalization over 24 hours.

In addition to the information requested on this form, also provide the name of the diving supervisor and, if applicable, a detailed report on gas embolism or decompression sickness as required by 46 CFR 197.410(a)(9).

Exempt from the commercial category are dives for:

1. Marine science research by educational institutions;
2. Research in diving equipment and technology;
3. Search and Rescue controlled by a government agency.

B. ALL OTHER DIVING. Diving accidents not covered by Instruction (6-A) but involving vessels subject to Instruction (2), VESSELS, must be reported if they result in death or injury causing incapacitation over 72 hours. (Ref. 46 CFR 4.03-1(c)).

HAZARDOUS MATERIALS

7. When an accident involves hazardous materials, public and environmental health and safety require immediate action. As soon as any person in charge of a vessel or facility has knowledge of a release or discharge of oil or a hazardous substance, that person is required to immediately notify the U. S. Department of Homeland Security's National Response Center (telephone toll-free 800-424-8802 - in the Washington, D.C. area call 202-426-2675). Anyone else knowing of a pollution incident is encouraged to use the toll-free telephone number to report it. If etiologic (disease causing) agents are involved, call the U.S. Public Health Service's Center for Disease Control in Atlanta, GA. (telephone 404-633-5313). (Ref. 42 USC 9603; 33 CFR 153; 49 CFR 171.15)

COMPLETION OF THIS FORM

8. This form should be filled out as completely and accurately as possible. Please type or print clearly. Fill in all blanks that apply to the kind of accident that has occurred. If a question is not applicable, the abbreviation "NA" should be entered in that space. If an answer is unknown and cannot be obtained, the abbreviation "UNK" should be entered in that space. If "NONE" is the correct response, then enter it in that space.

9. Once completed, deliver or mail this form as soon as possible to the Coast Guard Marine Safety, Marine Inspection or Activities Office nearest the location of the casualty or, if at sea, nearest the arrival port.

10. Amplifying information for completing the form:

A. Block 16 - "LOCATION" - Latitude and longitude to the nearest tenth of a minute should always be entered except in those rivers and waterways where a mile marker system is commonly used. In these cases, the mile number to the nearest tenth of a mile should be entered. If the latitude and longitude, or mile number, are unknown, reference to a known landmark or object (buoy, light, etc.) with distance and bearing to the object is permissible. Always identify the body of water or waterway referred to.

B. Tug or towboat with tow - Tugs or towboats with tows under their control should complete all applicable portions of the CG-2692. SECTION II should be completed if a barge causes or sustains damage or meets any other reporting criteria. If additional barges require reporting, the "Barge Addendum," CG-2692A, may be used to provide the information for the additional barges.

C. Moored/Anchored Barge - If a barge suffers a casualty while moored or anchored, or breaks away from its moorage, and causes or sustains reportable damages or meets any other reporting criteria, enter the location of its moorage in Block (1) of the CG-2692 and complete the form except for Blocks (2) through (13). The details will be entered in SECTION II for one barge and on the "Barge Addendum" CG-2692A, for additional barges.

D. SECTION III - Personnel Accident Information - SECTION III must be completed for a death or injury. In addition, applicable portions of SECTIONS I, II and IV must be completed. If more than one death or injury occurs in a single incident, complete one CG-2692 for one of the persons injured or killed, and attach additional CG-2692's, filling out Blocks (1) and (2) and SECTION III for each additional person.

E. BLOCK 44 - Describe the sequence of events which led up to this casualty. Include your opinion of the primary cause and any contributing causes of the casualty. Briefly describe damage to your vessel, its cargo, and other vessels/property. Include any recommendations you may have for preventing similar casualties. *ALCOHOL AND DRUG INFORMATION.* Provide the following information with regard to each person determined to be directly involved in the casualty: name, position aboard the vessel, whether or not the person was under the influence of alcohol or drugs at the time of the casualty, and the method used to make this determination. If toxicological testing is conducted the results should be included; if results are not available in a timely manner, provide the results of the toxicological test as soon as practical and indicate that this is the case in block 44 of the casualty form.

NOTICE: The information collected on this form is routinely available for public inspection. It is needed by the Coast Guard to carry out its responsibility to investigate marine casualties, to identify hazardous conditions or situations and to conduct statistical analysis. The information is used to determine whether new or revised safety initiatives are necessary for the protection of life or property in the marine environment.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number.

The Coast Guard estimates that the average burden for this report is 1 hour. You may submit any comments concerning the accuracy of this burden estimate or any suggestions for reducing the burden to: Commandant (G-MOA), U.S. Coast Guard, Washington, DC 20593-0001 or Office of Management and Budget, Paperwork Reduction Project (1625-0001), Washington, DC 20503

APPENDIX D

Float Plan

Float plans detail your intentions. It describes your course, itinerary, vessel description, expected date of arrival at your destination, and your expected return time. Leave the plan with a friend or relative, who in turn can notify the Coast Guard in the event you fail to return.

This appendix contains an example of a float plan, currently in use, that you can copy and utilize.

Float Plan

Complete this form before going boating and leave it with a reliable person who can be depended upon to notify the Coast Guard or other rescue organization, should you not return as scheduled.

Do not file this plan with the Coast Guard. Remember to contact your friend in case of delay and when you return.

1. Person Reporting Overdue

Name_____Phone_____

Address_____

2. Description of Boat

Name_____

Registration/Documentation No. _____ Length____

Make_____ Type ____

Hull Color_____ Trim Color_____

Fuel Capacity____ Engine Type____No. of Engines__

Distinguishing Features_____

_____

3. Operator of Boat

Name_____

Age _____

Health _____ Phone _____

Address_____

_____

Operator's Experience _____

_____

4. Survival Equipment (Check as Appropriate)

❑ #___PFDs	❑ Flares	❑ Mirror
❑ Smoke Signals	❑ Flashlight	❑ Food
❑ Paddles	❑ Water	❑ Anchor
❑ Raft or Dinghy	❑ EPIRB	
❑ Others		

5. Marine Radio: ❑ Yes ❑ No

Type _____ Freqs. _____

Digital Selective Calling (DSC) ❑ Yes ❑ No

6. Trip Expectations

Depart from _____

Departure Date _____ Time _____

Going to_____

Arrival Date _____ Time _____

If operator has not arrived/returned by:
Date_____Time _____
call the Coast Guard or Local authority at the following number:

_____

_____

7. Vehicle Description

License No. _____ Make _____

Model_____ Color _____

Where is vehicle parked? _____

_____

8. Persons on Board

Name Age Phone Medical Conditions

_____

_____

_____

_____

_____

_____

_____

9. Additional Information

_____

_____

_____

_____

_____

APPENDIX E

Trailering

A properly selected trailer supports the boat, makes towing safer, and loading and unloading easier. Improper trailering can cause serious traffic accidents and is a major cause of boat damage. It is your responsibility to familiarize yourself with proper towing procedures before towing your boat on the road.

When selecting a trailer keep the following in mind:

- Trailer must match the boat and load.
- Check the requirements for brakes, lights, emergency breakaway system, and registration in your area.
- The towing vehicle must have adequate power, cooling, transmission, tires, brakes, wheelbase, and suspension to tow the boat.
- The boat and trailer must not exceed the gross vehicle weight rating and towing capacity of the towing vehicle.

HITCH

Overloading can cause hitch failure leading to injury-causing accidents. Total weight of the loaded trailer must not exceed the capacity marker on the hitch of the tow vehicle.

Hitches are divided into classes that specify the gross trailer weight and maximum tongue weight for each class. Always use a hitch with the same class number as the trailer.

There are two basic hitch types:

- Weight-Carrying – This simple relatively inexpensive bumper hitch supports the entire trailer tongue weight at the hitch. It is adequate for some light boats and trailers but may be banned in some areas.
- Weight-Distributing – This hitch distributes the load to all wheels of both the tow vehicle and the trailer. It can handle heavier loads with less wear on the tow vehicle. Some hitches have anti-sway bars to improve control by minimizing trailer fishtailing.

Ensure that the hitch ball matches the trailer coupler. When latched the coupler should fit snugly on the ball.

SAFETY CHAINS

Safety chains ensure that the trailer will not become completely separated from the towing vehicle while being towed. Crisscross the chains under the trailer tongue to prevent the tongue from dropping to the road if the trailer separates from the hitch ball.

BRAKES

The boat trailer should be equipped with a braking system to help relieve stress on the tow vehicle when braking. Ensure the trailer brakes are operational and in good condition.

TOWING A TRAILER

When towing a trailer be aware that the trailer will track in a wider turn than the tow vehicle. When turning be careful that the trailer does not strike another vehicle or object. Turns should be made at an appropriate speed.

You should always practice backing a trailer before you get into a confined launch site. Get accustomed to working with a trailer. Understand how backing a trailer is different than backing a car. The more you practice the more confident you become with your trailer.

LAUNCHING YOUR BOAT

For common courtesy prepare your boat for launch away from the ramp. This includes removing tie-downs, securing loose gear, loading personal gear, and making sure the drain plugs are installed.

When handling cable to launch or retrieve a boat, always wear gloves.

CHECKLIST

When preparing your outing you should always use a checklist to ensure you address those items that will ensure a pleasant outing.

PRE-TOW CHECKLIST

_____	Check trailer tire pressures
_____	Trailer wheel bearings greased
_____	Trailer and tow vehicle lights and brakes – operating
_____	Boat steering mechanism – lubricated
_____	Tiedowns – secured
_____	Winch line – taut
_____	Winch anti-reverse gear – engaged
_____	Motor(s) – in traveling position
_____	Coupler – tight
_____	Hitch ball – lightly greased to reduce friction
_____	Safety chains – properly installed and secured
_____	Tongue jack – raised
_____	Spring bars – adjusted
_____	Boat canvas – down and secured
_____	Boat cover – secured
_____	Boating gear – secured
_____	Registration, proof of insurance, other documentation – present

PRE-LAUNCH CHECKLIST

_____ Drain plugs – installed (first visual check)

_____ Boat cover – removed

_____ Wheel chocks – available

_____ Equipment – loaded for proper trim

_____ Bow and stern lines – fastened

_____ Tiedowns – removed

_____ Fuel tanks – full

_____ Outboard or stern drive – tilted up and engine support removed (if applicable)

_____ Check boat systems (engine room blower, bilge pumps, lights, etc.) – operational

_____ Electrical connection to tow vehicle – unplugged

_____ Trailer wheel bearings – cool

_____ Ramp conditions, water depth, current – checked

_____ Drain plugs – installed (second visual check)

LAUNCHING CHECKLIST

_____ Station someone to help direct.

_____ Back straight down the ramp.

_____ Stop with trailer wheels at waters edge.

_____ Secure tow vehicle with parking brake and wheel chocks.

_____ Station helper to hold bow and stern lines from the ramp.

_____ Tighten winch brake and release anti-reverse lock. Do not disconnect winch cable.

_____ If equipped release tilt latch.

_____ Allow boat to slide off trailer.

_____ Unhook winch cable from bow and rewind or secure trailer.

_____ Pull boat to appropriate location and secure.

_____ Return trailer tilt to horizontal and lock.

_____ Remove chocks and drive tow vehicle and trailer from ramp.

When you are on the boat lower the engine(s) into the water. If necessary turn on engine room blower for a few minutes to clear the engine compartment of fumes. Start the engine and allow to warm up. Depart the area slowly.

When returning to the loading ramp prepare the boat before approaching the ramp.

BOAT RETRIEVAL

_____ Tilt the outboard or stern drive(s) up.

_____ Back trailer down ramp and into the water. Do not submerge the trailer too deep.

_____ Secure the tow vehicle with the parking brake and chocks.

_____ Guide the boat onto the trailer. Use bow and stern lines to help.

_____ Hook winch cable to boat stem eye.

_____ Pull boat onto the trailer and temporarily secure the boat.

_____ Remove tow vehicle from ramp and drive to the securing area.

_____ Remove drain plug and drain the bilge.

_____ If in salt water wash hull and trailer with fresh water as soon as possible.

_____ Inspect the propeller for nicks or damage.

_____ Inspect the hull for damage.

_____ Wipe hull to prevent water spots and to keep the hull clean.

_____ If desired at this time clean the boat and prepare for next outing.

_____ Properly secure the boat for road travel.

_____ Reconnect trailer lights and ensure they are operational.

APPENDIX F

Water Skiing

Water skiing has brought a special set of safety precautions to observe while boating.

1. Water ski only in safe and/or designated areas. Stay away from areas designated for swimmers and skin divers.
2. NEVER ski while under the influence of alcohol or drugs.
3. Ski only in water free of underwater obstructions. Avoid shallow waters, other boats, navigational aids, and other obstructions.
4. Ski only during daylight when visibility is good. Never ski after dark. Not only is it dangerous, but it is illegal.
5. Do not ski with 300 feet of another vessel, 100 feet of the shore, or dock.
6. Do not ski in rough waters.
7. Do not ski when it is raining.
8. If skiing in cooler weather understand the effects of hypothermia and take the proper precautions.
9. All skiers must wear a USCG approved personal flotation device (PFD).
10. Ensure everyone understands the hand signals.
11. A competent observer must watch the skier at all times and keep the driver informed of the skiers hand signals or if the skier is in trouble.
12. The boat driver must always give full attention to driving and operating the boat.
13. Give immediate attention to a downed skier. Other boats may not see him or her.
14. Turn off the engine(s) when approaching the skier. Drive the boat carefully in the vicinity of the downed skier. Approach the skier from the lee side (opposite the direction of the wind).
15. Do not swamp the boat when retrieving a skier.
16. Never back up to anyone in the water.
17. Never drive a boat behind a water skier. Should the skier fall you may hit him or her.
18. Always observe local restrictions on length of tow line.
19. Understand and use water skiing hand signals.
20. Always be considerate of others.
21. Non-swimmers should never ski.

Understanding hand signals is critical to safe skiing. All parties should agree to what each signal means to prevent confusion. The more common signals are illustrated below.

Left Turn
Arm outstretched pointing left

Right Turn
Arm outstretched point right

Skier OK
Hands clenched together overhead

Speed OK
Raised arm with thumb and finger joined to form circle

Back to Dock
Pat top of head

Stop
Hand up, palm forward

Slower
Palm or thumb pointing down

Faster
Palm or thumb pointing up

Retrieval
One ski extended out of the water

APPENDIX G

Maintenance Log Forms

This appendix contains a maintenance log which you can copy and use to document maintenance actions performed on this vessel.

It is not mandatory that you use this specific log to document maintenance actions, as you may have a preference for a certain style of maintenance log available on the open market. It is, however, important that you keep some type of maintenance log which documents every maintenance action taken on the vessel. The log may serve as an excellent indicator of potential problems as well as a record of service required by warranties and service agreements.

MAINTENANCE LOG

DATE	ENGINE HOURS	MAINTENANCE ACTION	COMPANY/ TECHNICIAN	COST

MAINTENANCE LOG

DATE	ENGINE HOURS	MAINTENANCE ACTION	COMPANY/ TECHNICIAN	COST

APPENDIX H

Technical Drawings

This appendix contains technical drawings for the models discussed in this manual. You should become acquainted with those drawings applicable to your boat.

LANCER 20
PLUMBING AND FUEL ROUTING

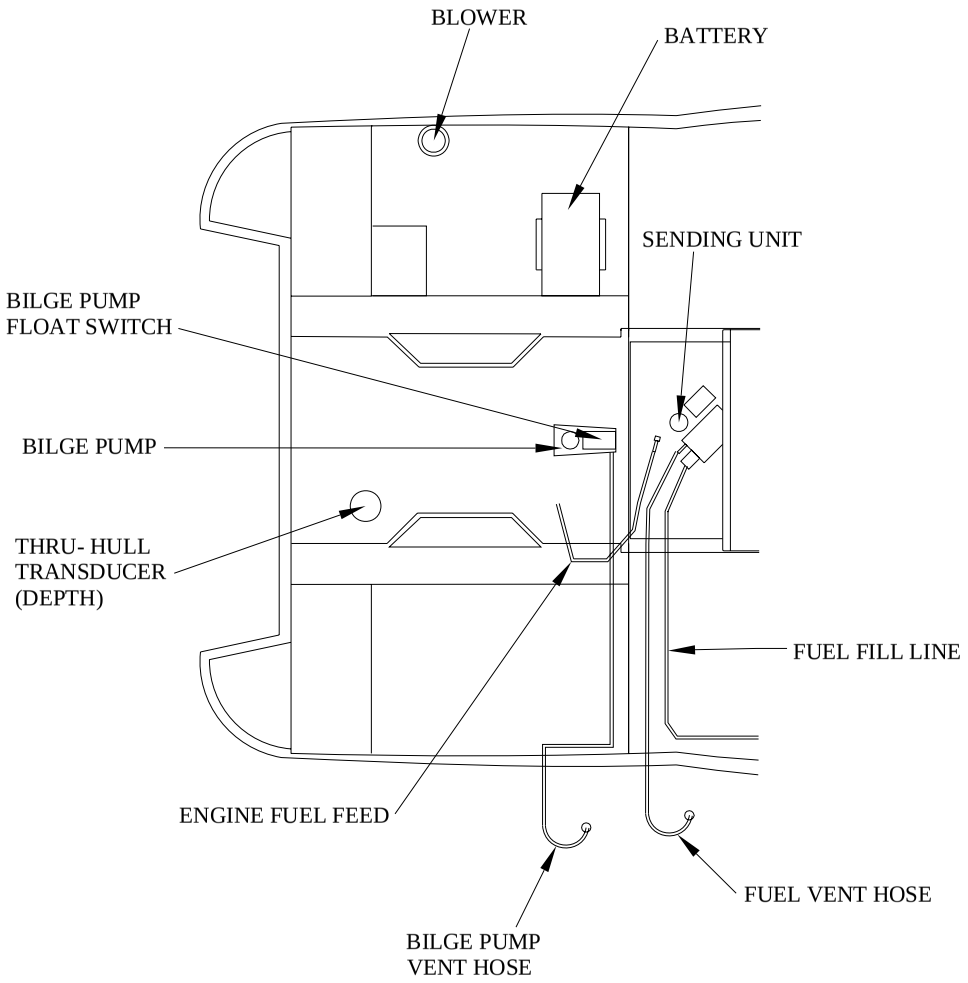
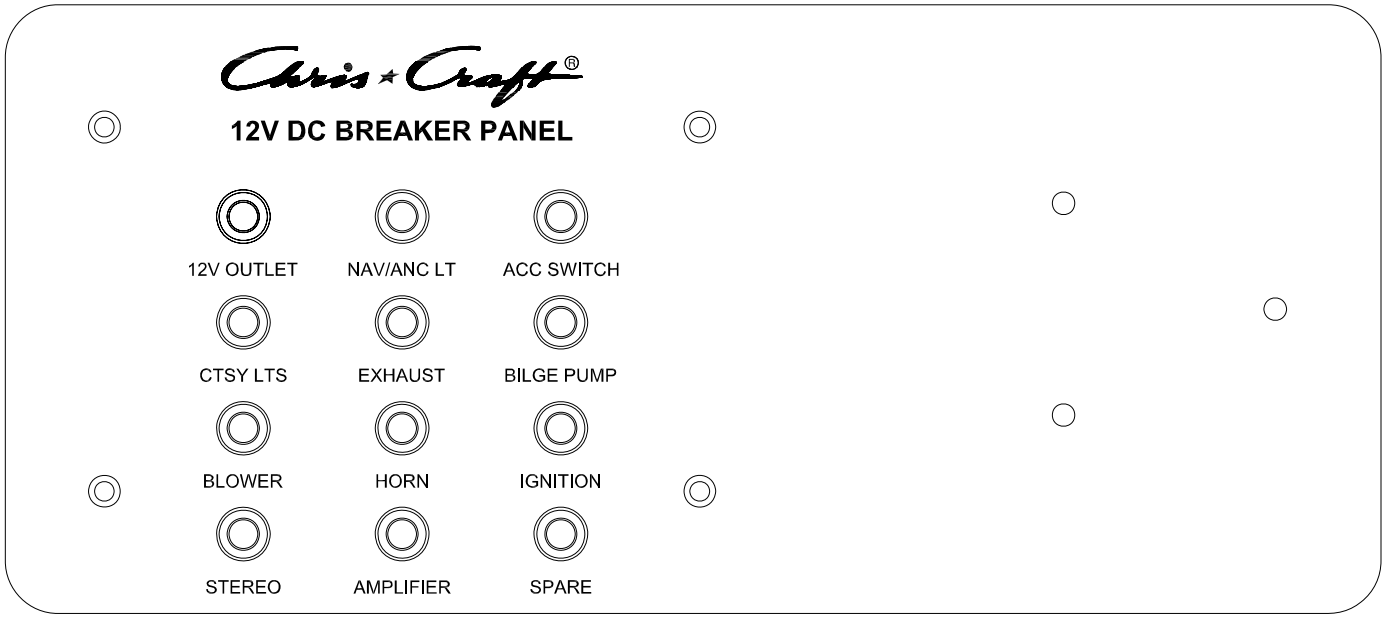


Figure 1. Lancer 20 – Plumbing and Fuel Routing

LANCER 20 HELM BREAKER PANEL



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
12V OUTLET	15 AMPS	NAV/ANCHOR LT	5 AMPS	ACCESSORY SW	NOT USED
COURTESY LTS	5 AMPS	EXHAUST	3 AMPS	BILGE PUMP	5 AMPS
BLOWR	7 AMPS	HORN	5 AMPS	IGNITION	10 AMPS
STEREO	3 AMPS	AMPLIFIER	15 AMPS	SPARE	NOT USED

Figure 2. Lancer 20 – Helm Breaker Panel

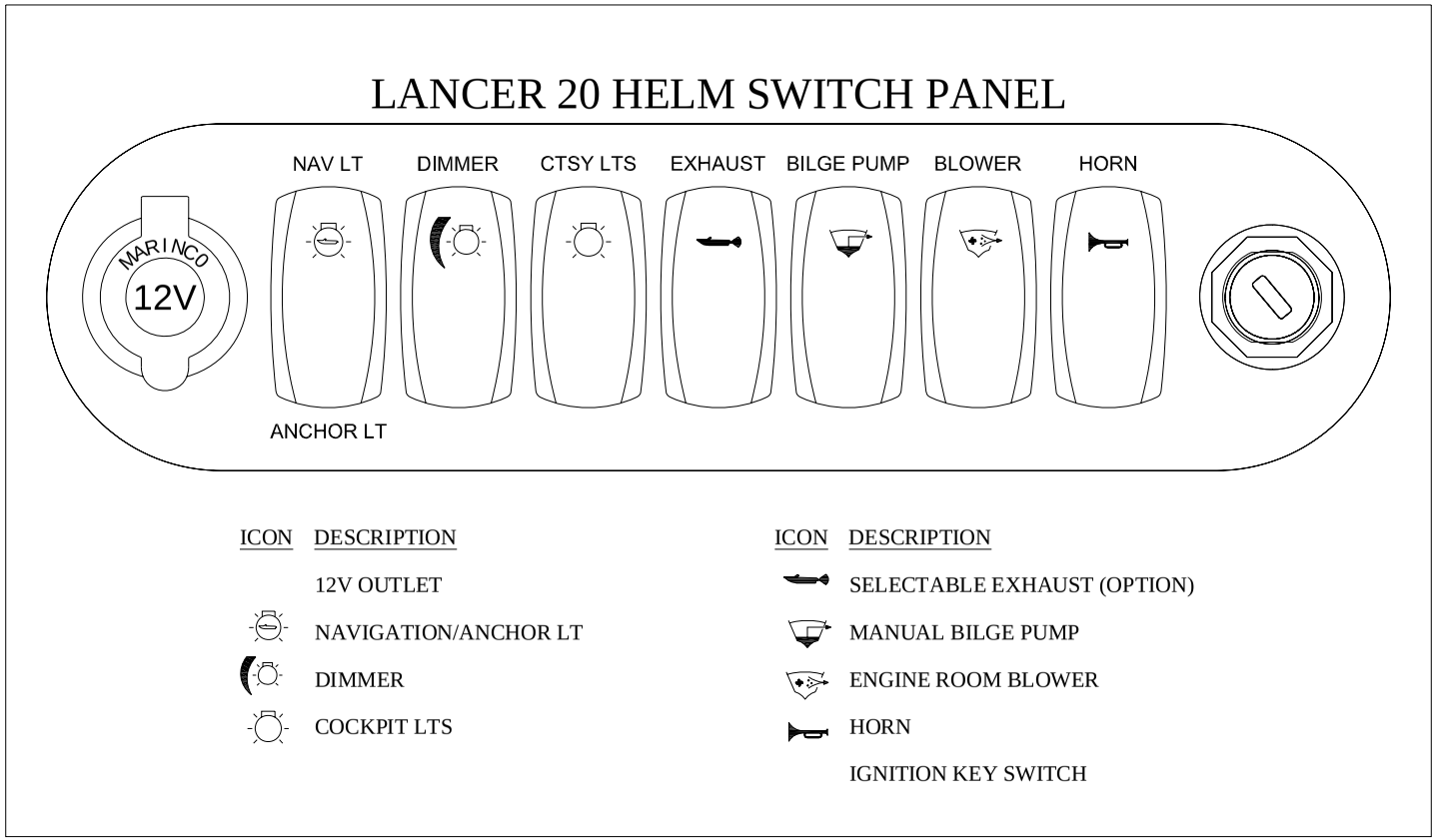


Figure 3. Lancer 20 – Helm Switch Panel

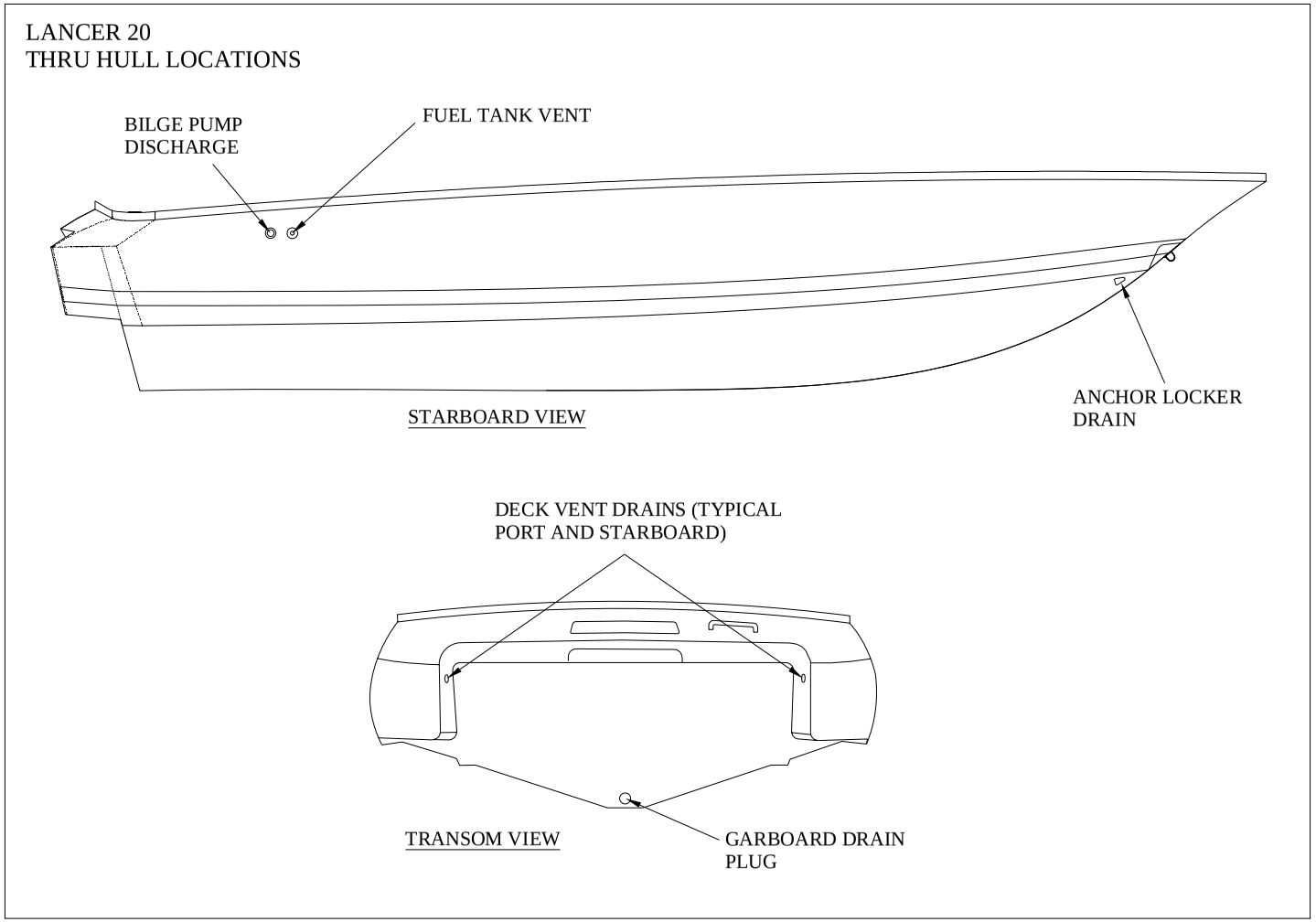
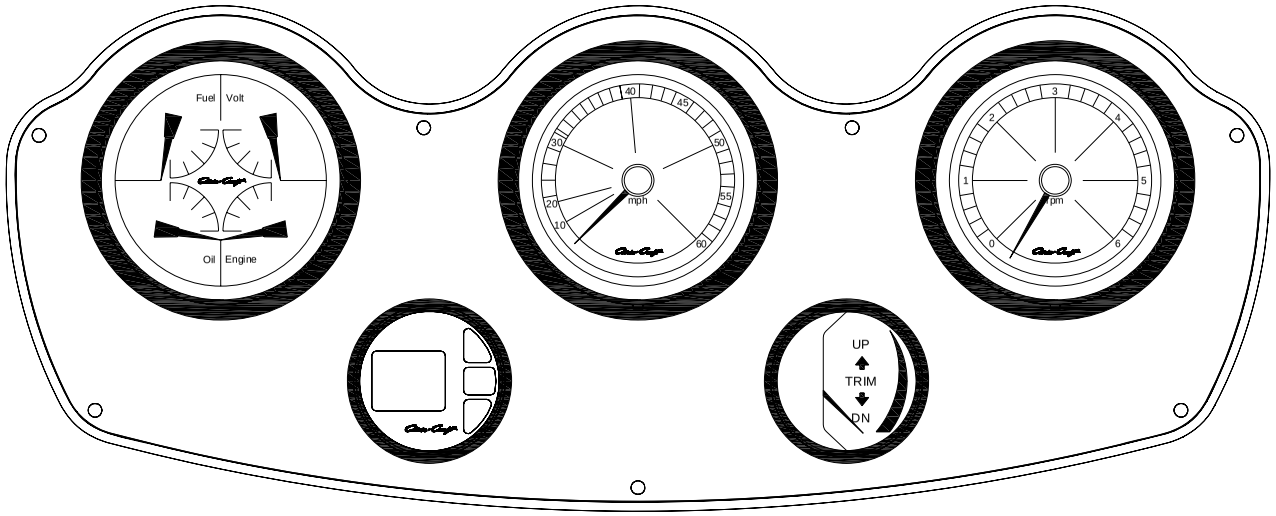


Figure 4. Lancer 20 – Thru-Hull Locations

LANCER 20 INSTRUMENT PANEL



PART DESCRIPTION

4" 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
2" DEPTH SOUNDER
4" SPEEDOMETER (0-60 MPH)
2" DRIVE TRIM INDICATOR
4" TACHOMETER (0-6000 RPM)

Figure 5. Lancer 20 – Instrument Panel

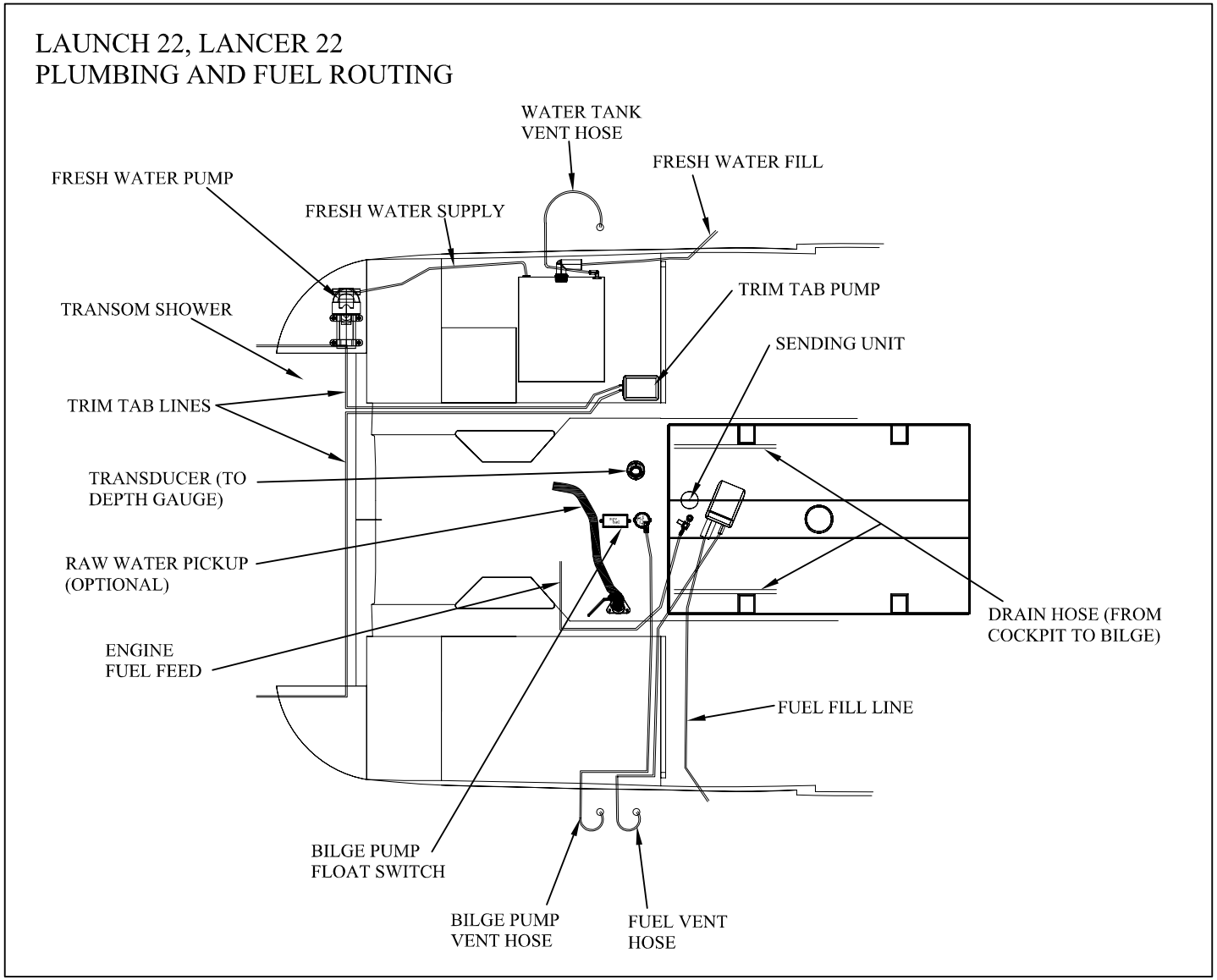
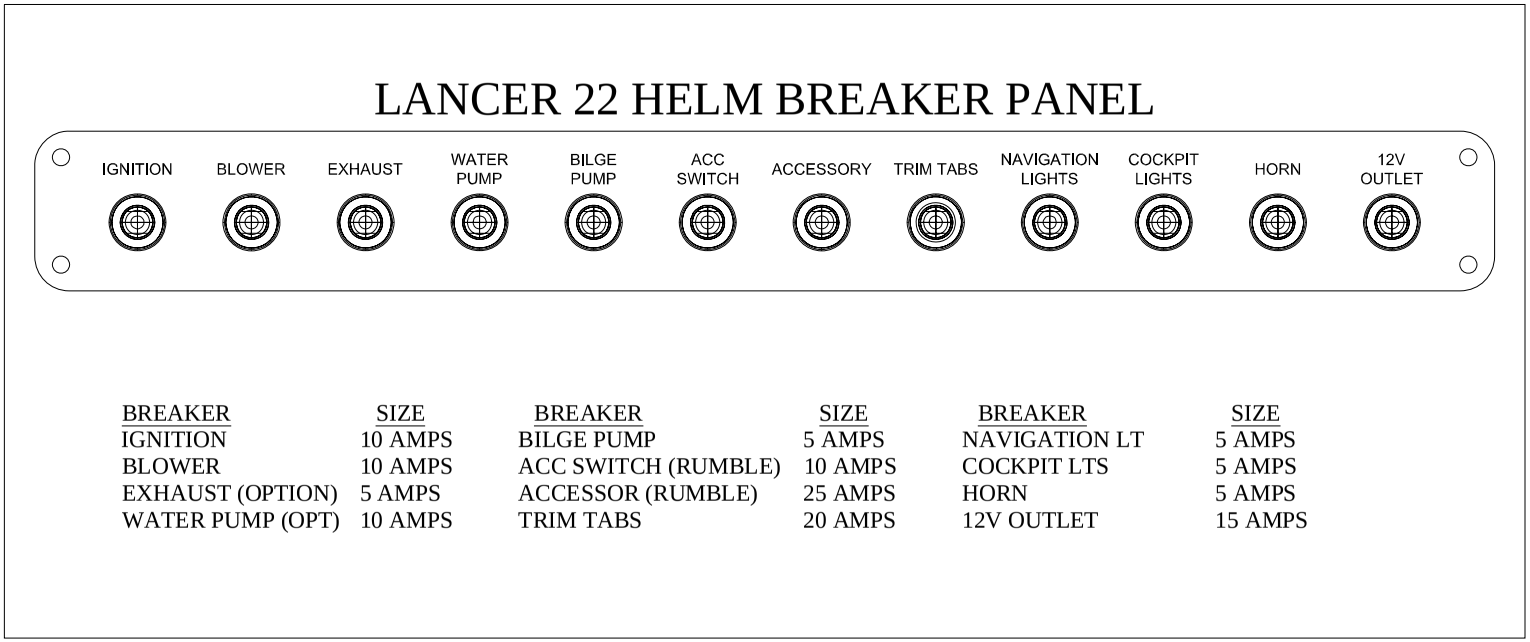


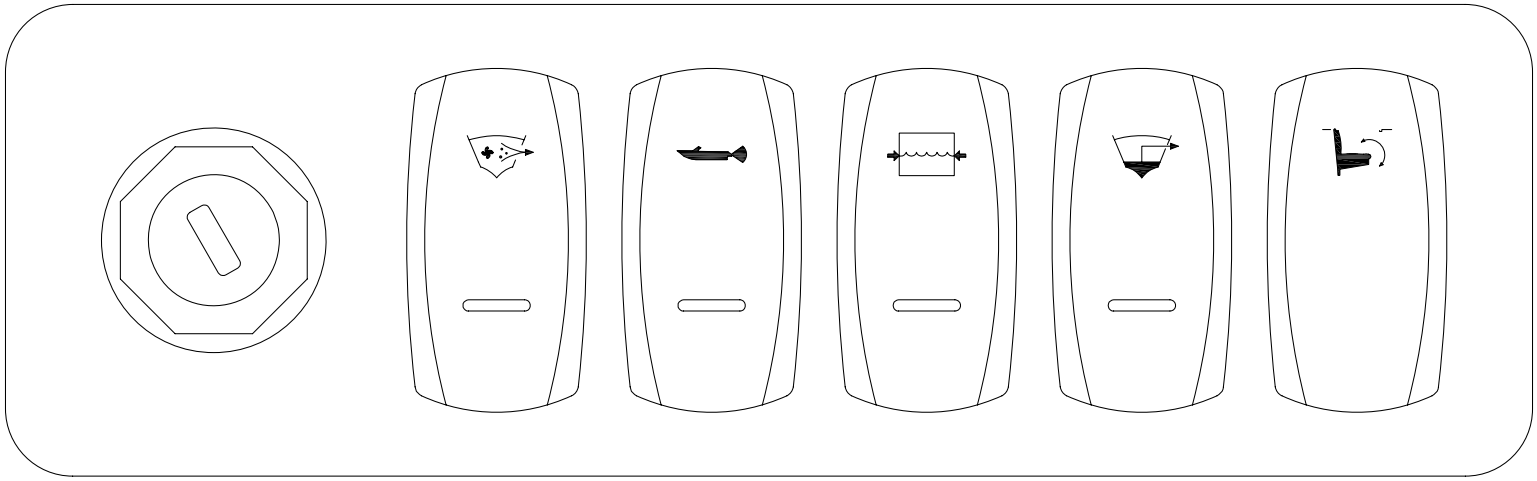
Figure 6. Lancer 22 – Plumbing and Fuel Routing



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
IGNITION	10 AMPS	BILGE PUMP	5 AMPS	NAVIGATION LT	5 AMPS
BLOWER	10 AMPS	ACC SWITCH (RUMBLE)	10 AMPS	COCKPIT LTS	5 AMPS
EXHAUST (OPTION)	5 AMPS	ACCESSOR (RUMBLE)	25 AMPS	HORN	5 AMPS
WATER PUMP (OPT)	10 AMPS	TRIM TABS	20 AMPS	12V OUTLET	15 AMPS

Figure 7. Lancer 22 – Helm Breaker Panel

LANCER 22 PORT SWITCH PANEL



ICON	DESCRIPTION	ICON	DESCRIPTION
	IGNITION KEY SWITCH		WATER PUMP (OPTION)
	ENGINE ROOM BLOWER		MANUAL BILGE PUMP
	SELECTABLE EXHAUST (OPTION)		ACCESSORY (NOT USED)

Figure 8. Lancer 22 – Port Switch Panel

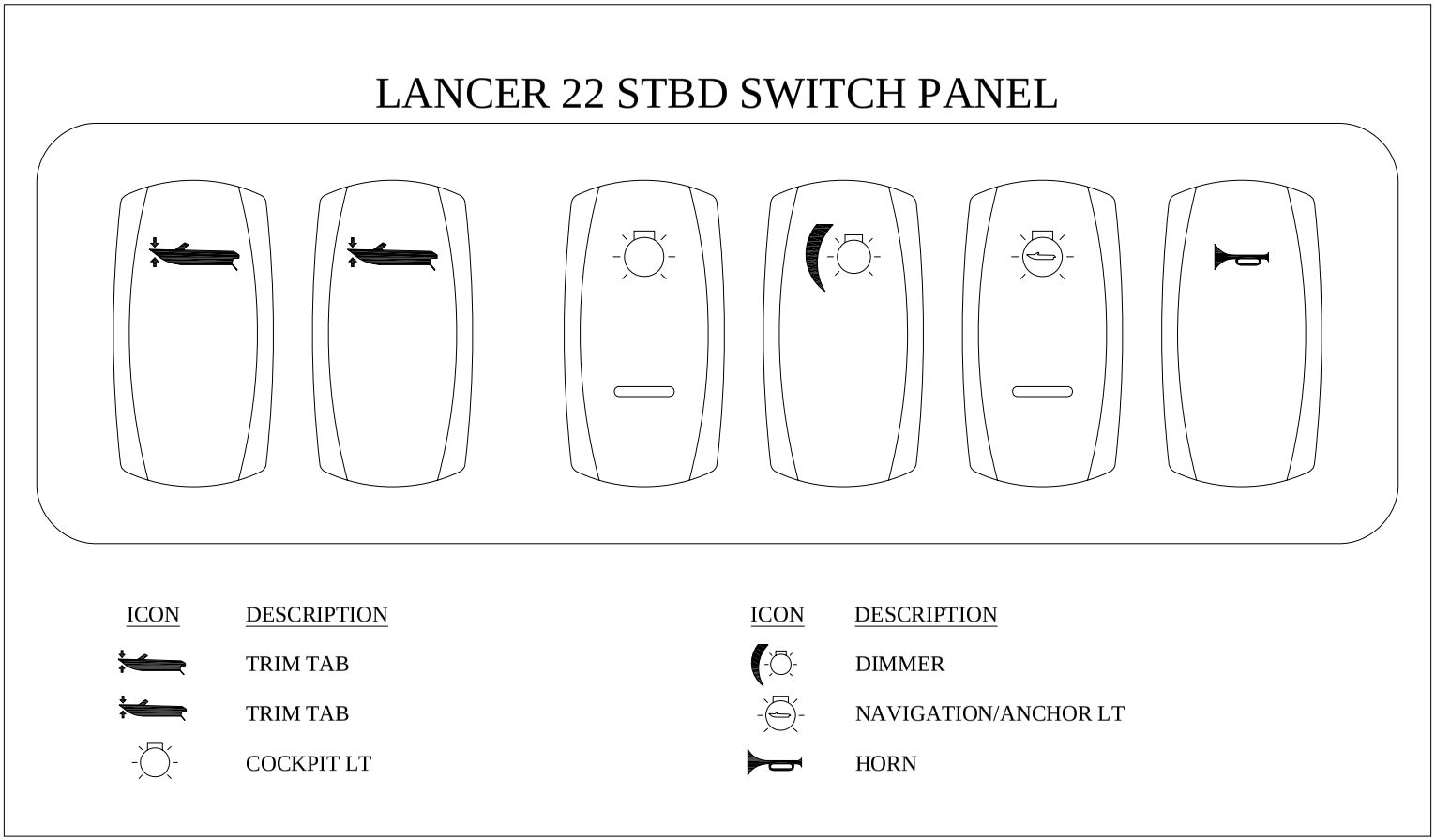
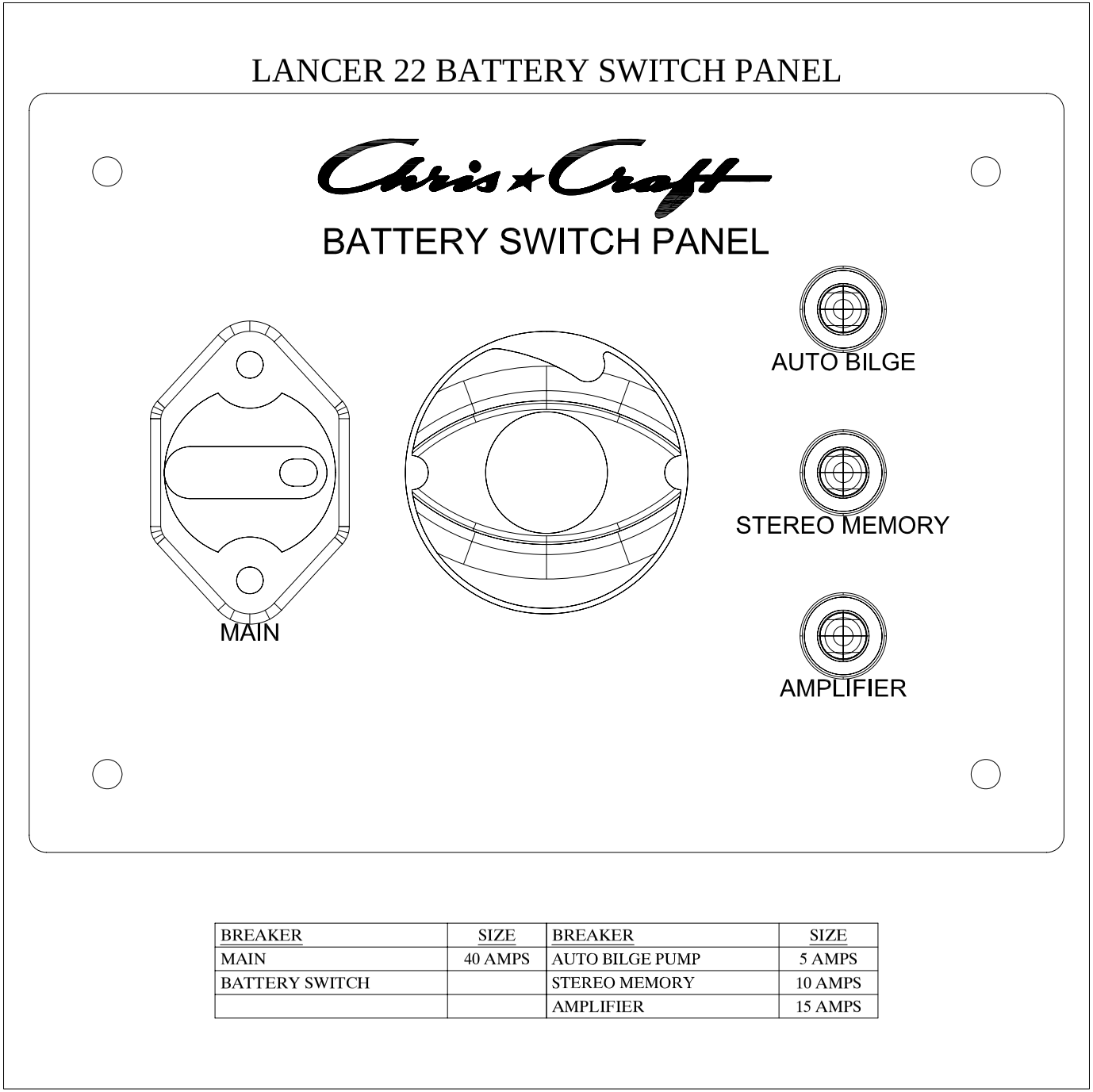


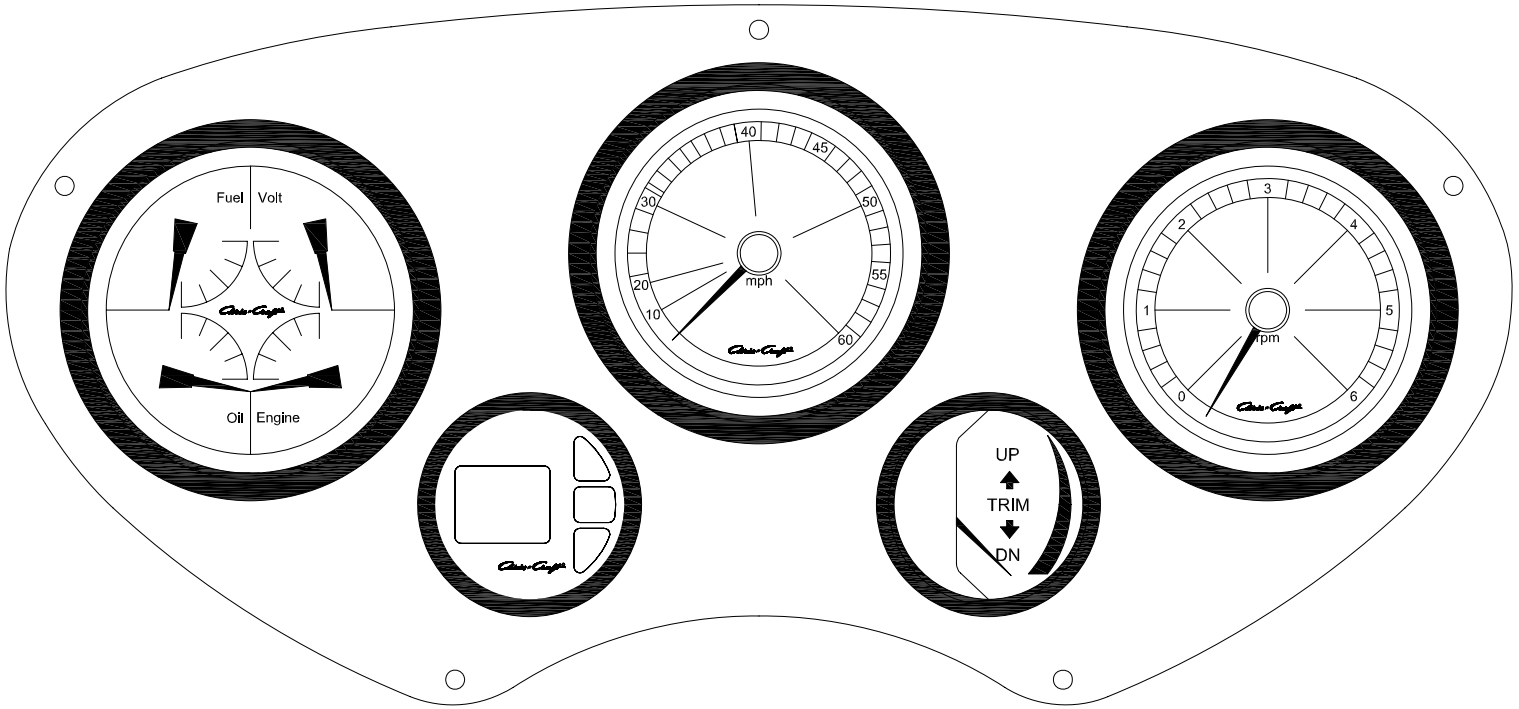
Figure 9. Lancer 22 – Starboard Switch Panel



BREAKER	SIZE	BREAKER	SIZE
MAIN	40 AMPS	AUTO BILGE PUMP	5 AMPS
BATTERY SWITCH		STEREO MEMORY	10 AMPS
		AMPLIFIER	15 AMPS

Figure 10. Lancer 22 – Battery Switch Panel

LANCER 22 INSTRUMENT PANEL



PART DESCRIPTION
4" 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
2" DEPTH SOUNDER
4" SPEEDOMETER (0-60 MPH)
2" DRIVE TRIM INDICATOR
4 " TACHOMETER (0-6000 RPM)

Figure 11. Lancer 22 – Instrument Panel

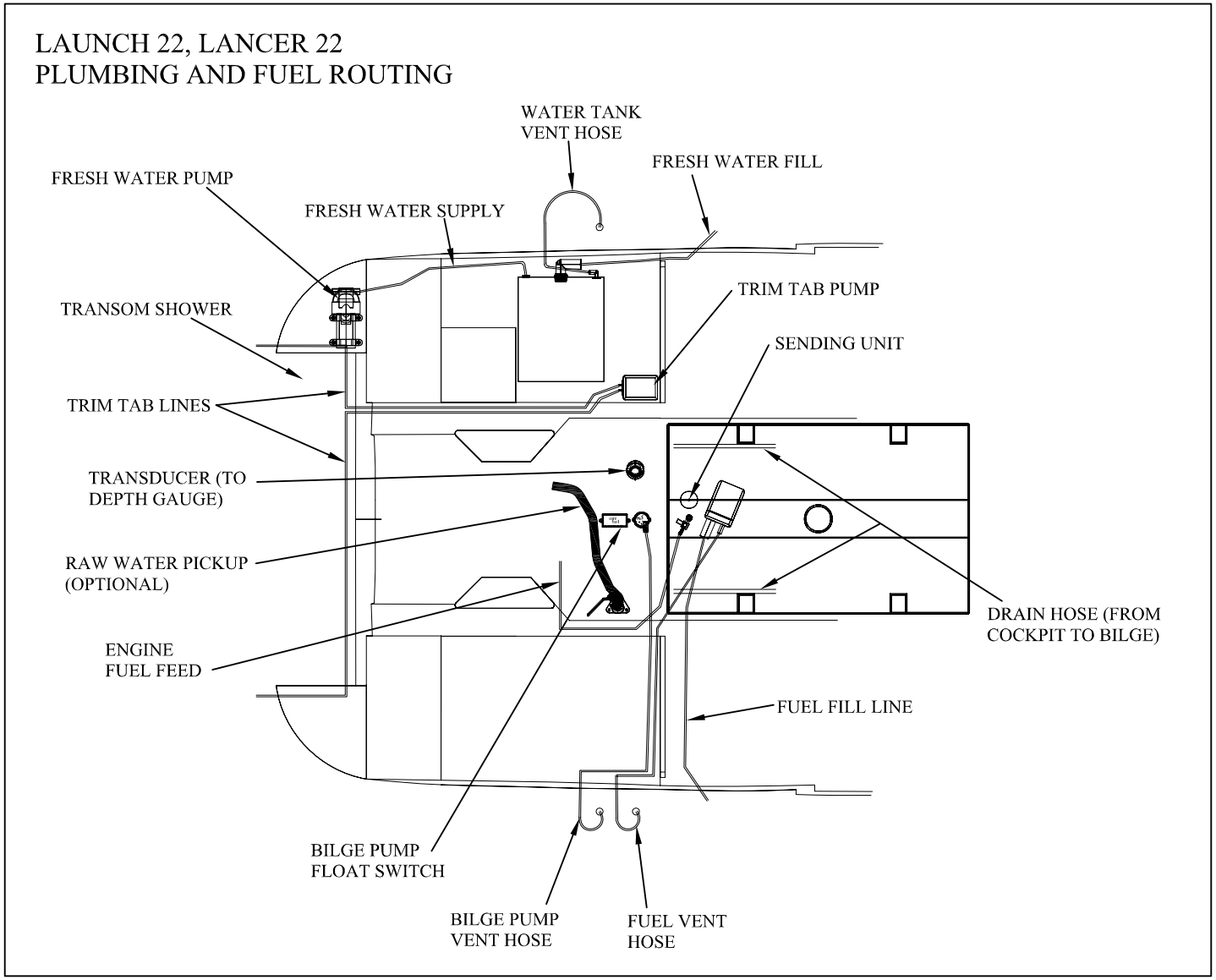
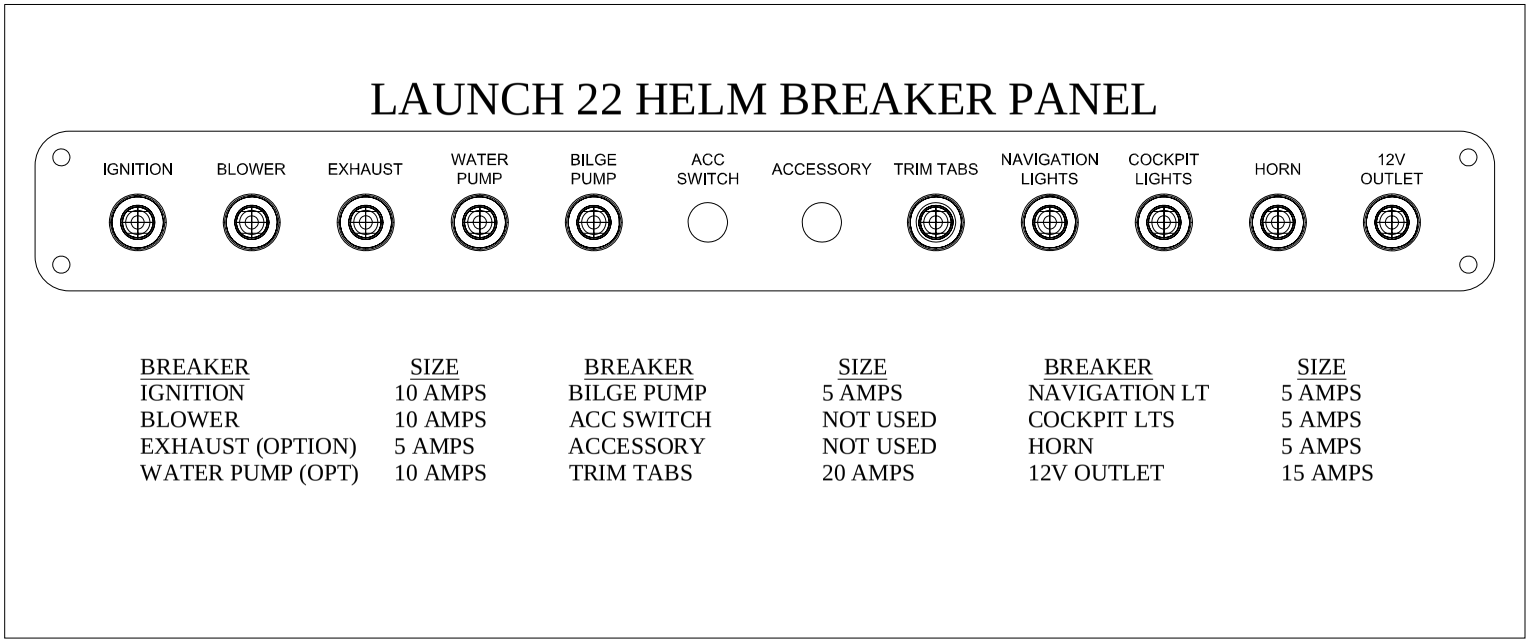


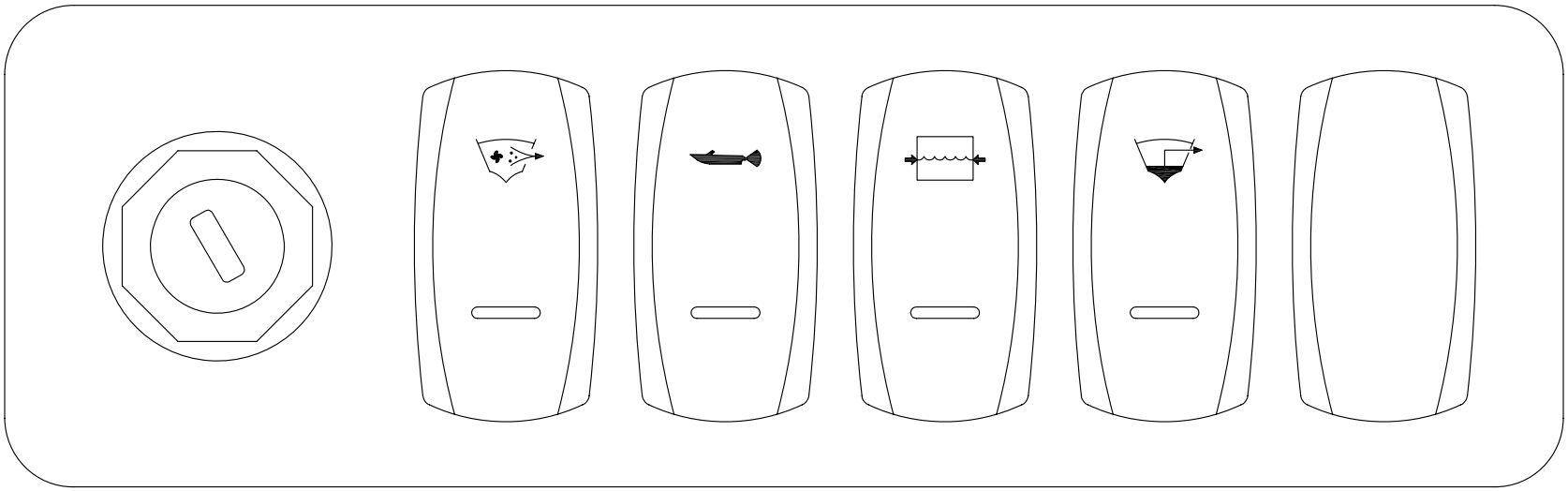
Figure 12. Launch 22 – Plumbing and Fuel Routing



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
IGNITION	10 AMPS	BILGE PUMP	5 AMPS	NAVIGATION LT	5 AMPS
BLOWER	10 AMPS	ACC SWITCH	NOT USED	COCKPIT LTS	5 AMPS
EXHAUST (OPTION)	5 AMPS	ACCESSORY	NOT USED	HORN	5 AMPS
WATER PUMP (OPT)	10 AMPS	TRIM TABS	20 AMPS	12V OUTLET	15 AMPS

Figure 13. Launch 22 – Helm Breaker Panel

LAUNCH 22 PORT SWITCH PANEL



ICON	DESCRIPTION	ICON	DESCRIPTION
	IGNITION KEY SWITCH		WATER PUMP (OPTION)
	ENGINE ROOM BLOWER		MANUAL BILGE PUMP
	SELECTABLE EXHAUST (OPTION)		ACCESSORY (NOT USED)

Figure 14. Launch 22 – Port Switch Panel

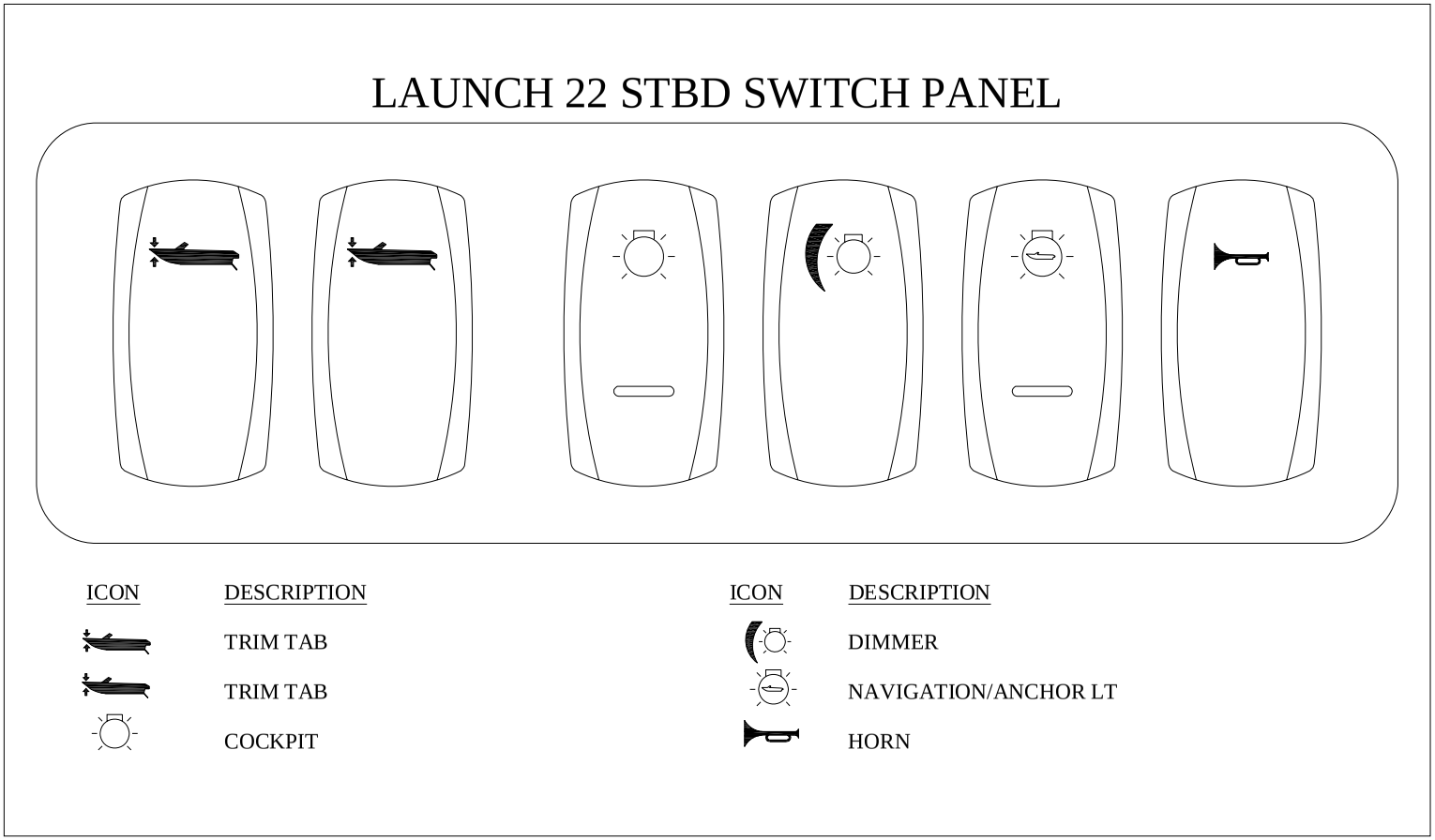
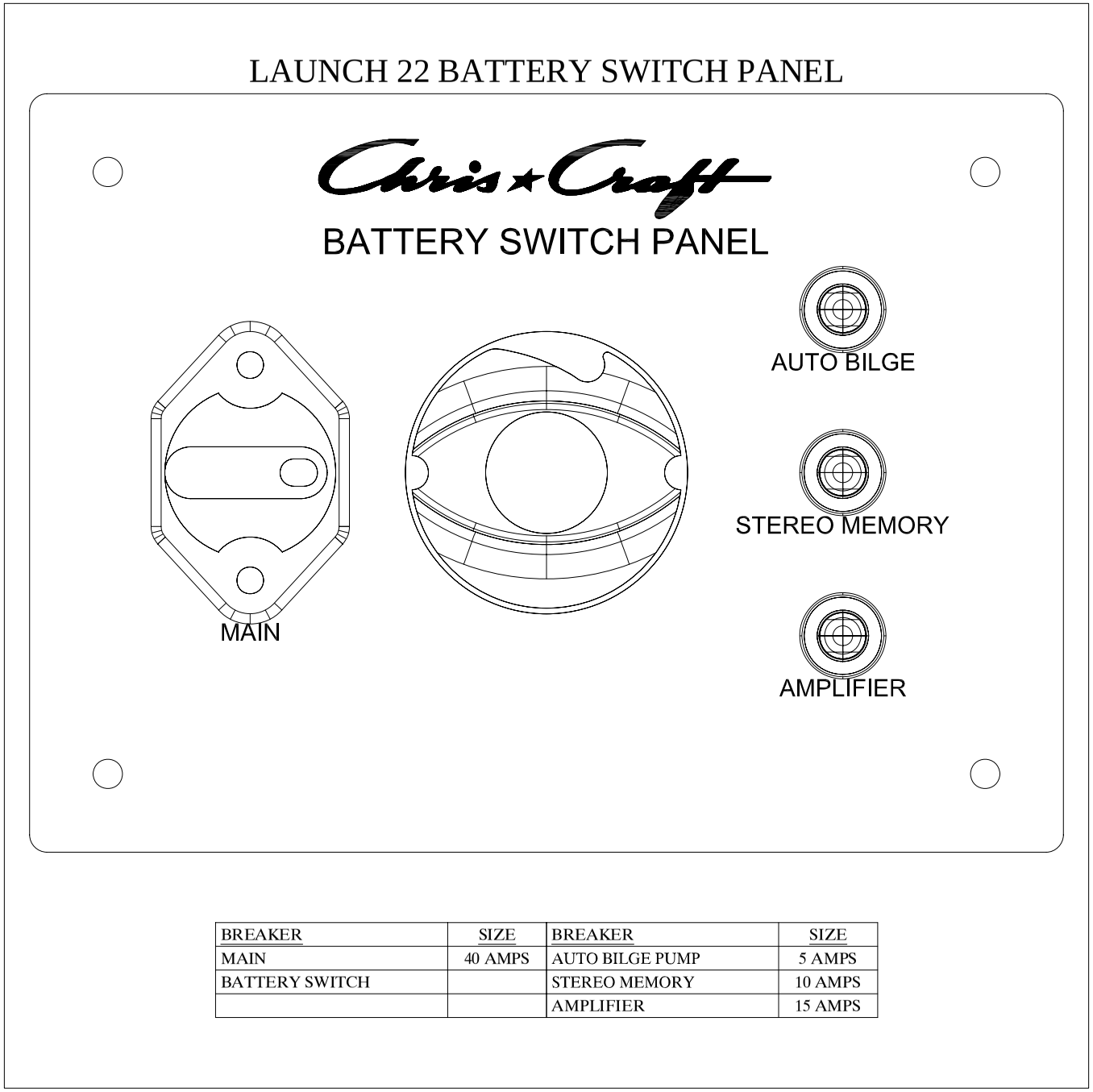


Figure 15. Launch 22 – Starboard Switch Panel



BREAKER	SIZE	BREAKER	SIZE
MAIN	40 AMPS	AUTO BILGE PUMP	5 AMPS
BATTERY SWITCH		STEREO MEMORY	10 AMPS
		AMPLIFIER	15 AMPS

Figure 16. Launch 22 – Battery Switch Panel

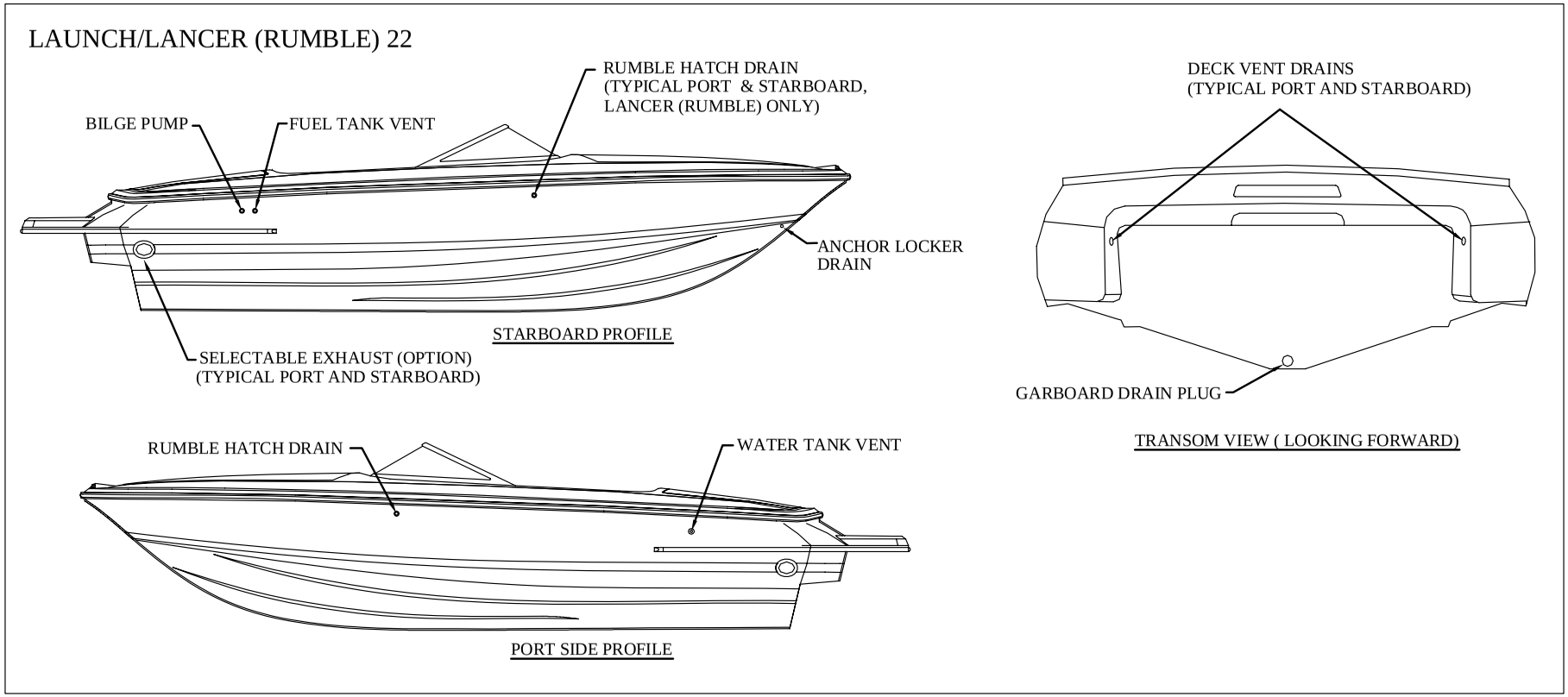
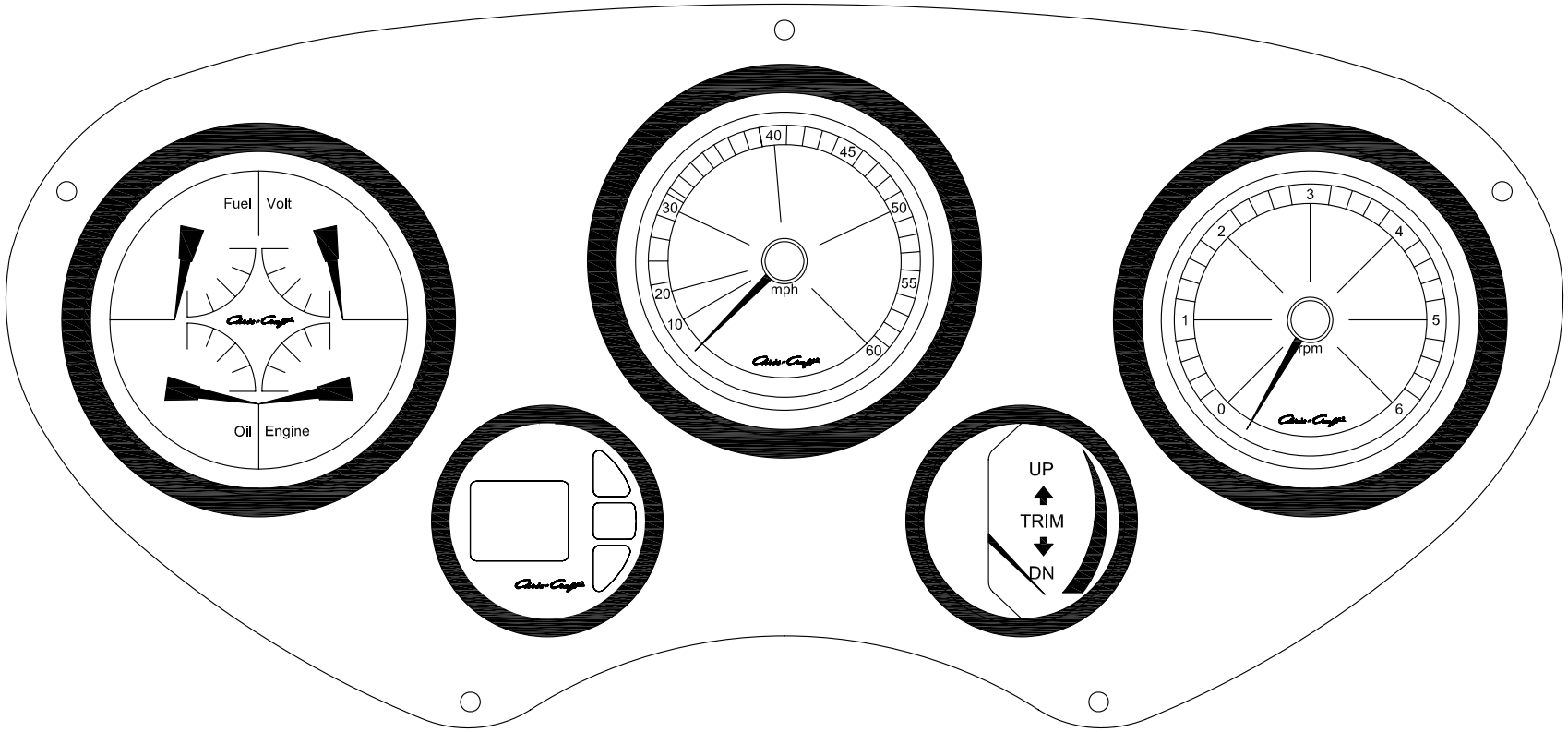


Figure 17. Launch 22 – Thru-Hull Locations

LAUNCH 22 INSTRUMENT PANEL



PART DESCRIPTION
4" 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
2" DEPTH SOUNDER
4" SPEEDOMETER (0-60 MPH)
2" DRIVE TRIM INDICATOR
4 " TACHOMETER (0-6000 RPM)

Figure 18. Launch 22 – Instrument Panel

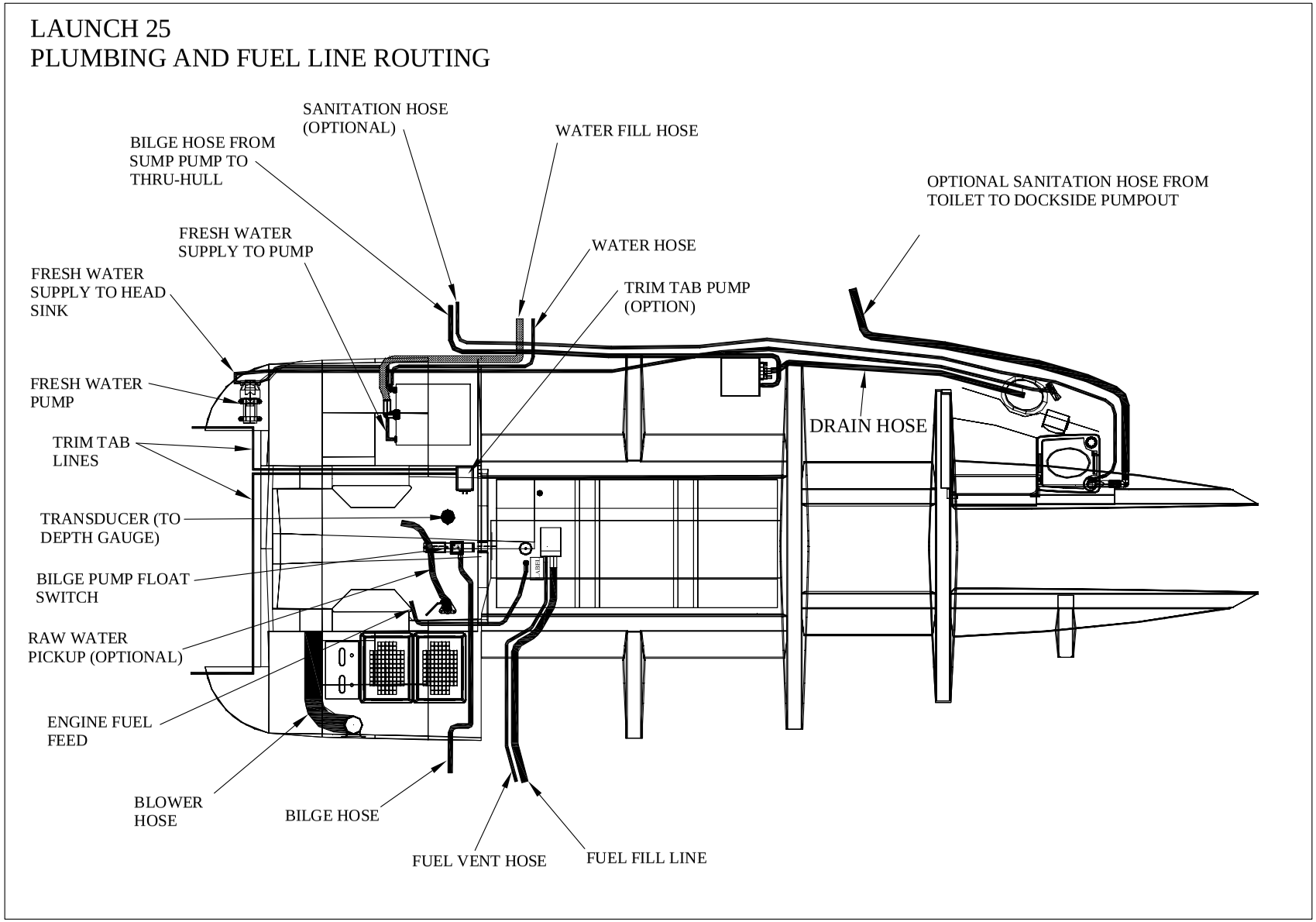
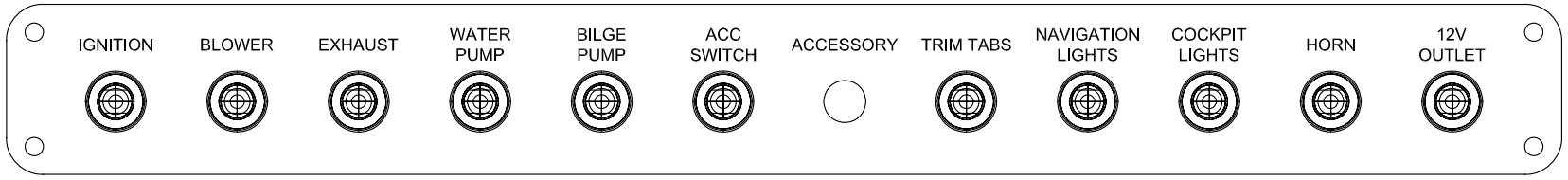


Figure 19. Launch 25 – Plumbing and Fuel Routing

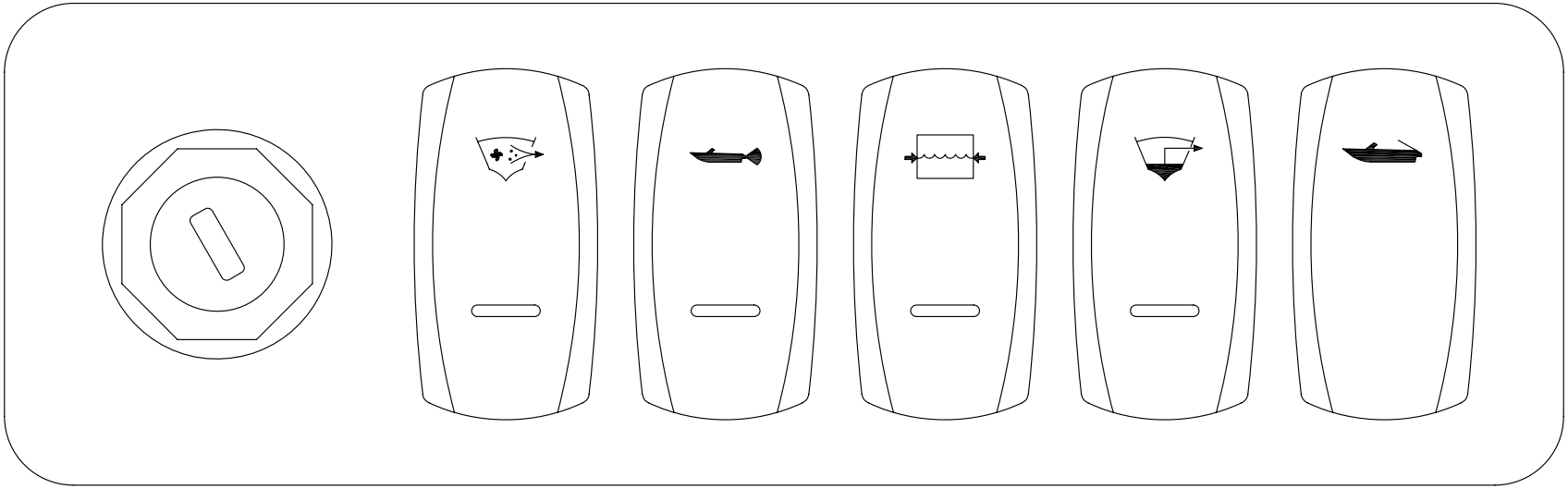
LAUNCH 25 HELM BREAKER PANEL



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
IGNITION	10 AMPS	BILGE PUMP	5 AMPS	NAVIGATION LT	5 AMPS
BLOWER	10 AMPS	ACC SWITCH (ENG HATCH)	20 AMPS	COCKPIT LTS	5 AMPS
EXHAUST (OPTION)	5 AMPS	ACCESSORY	NOT USED	HORN	10 AMPS
WATER PUMP (OPT)	10 AMPS	TRIM TABS	20 AMPS	12V OUTLET	15 AMPS

Figure 20. Launch 25 – Helm Breaker Panel

LAUNCH 25 PORT SWITCH PANEL



ICON	DESCRIPTION	ICON	DESCRIPTION
	IGNITION KEY SWITCH		WATER PUMP (OPTION)
	ENGINE ROOM BLOWER		MANUAL BILGE PUMP
	SELECTABLE EXHAUST (OPTION)		ENGINE HATCH

Figure 21. Launch 25 – Port Switch Panel

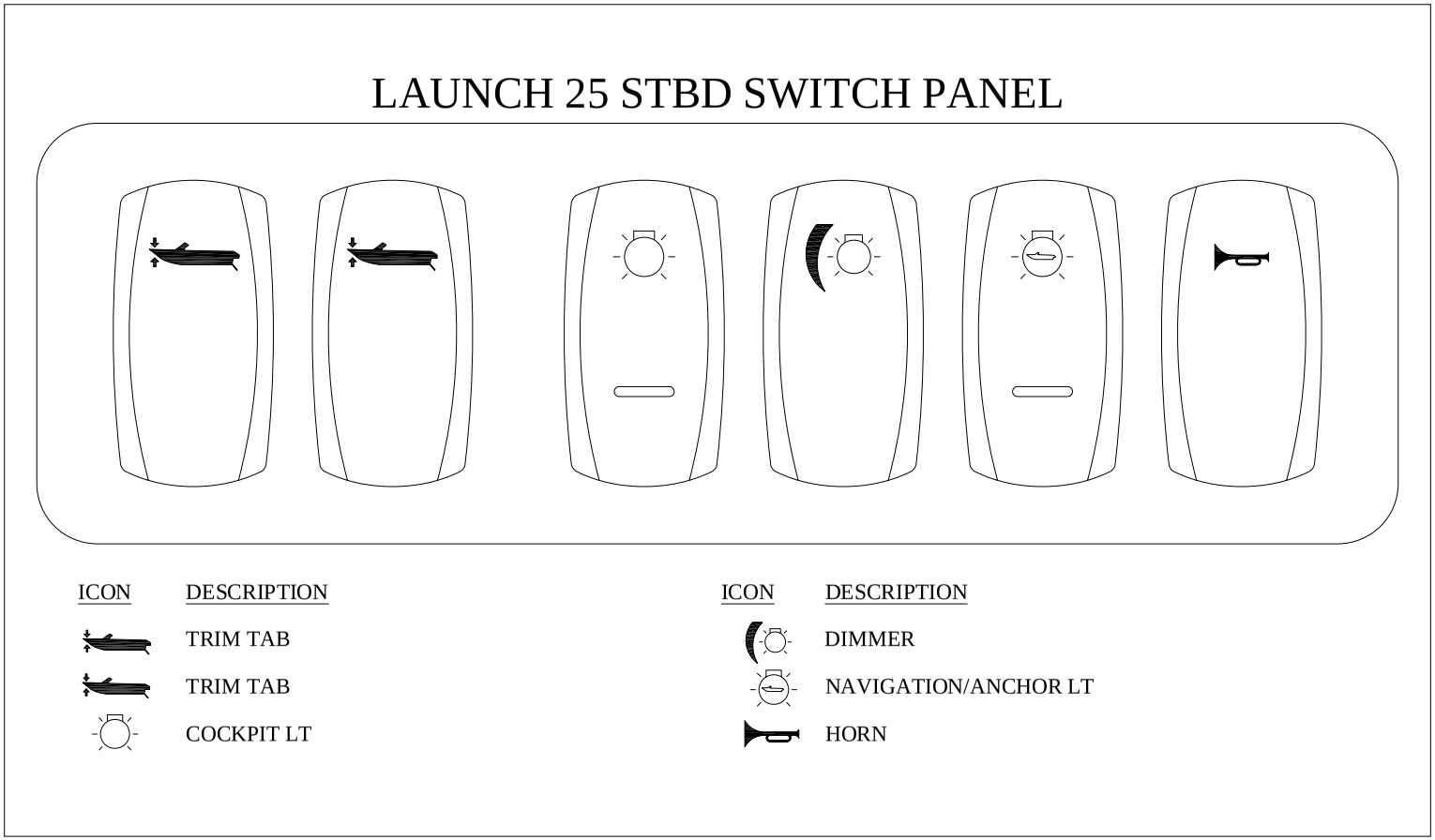
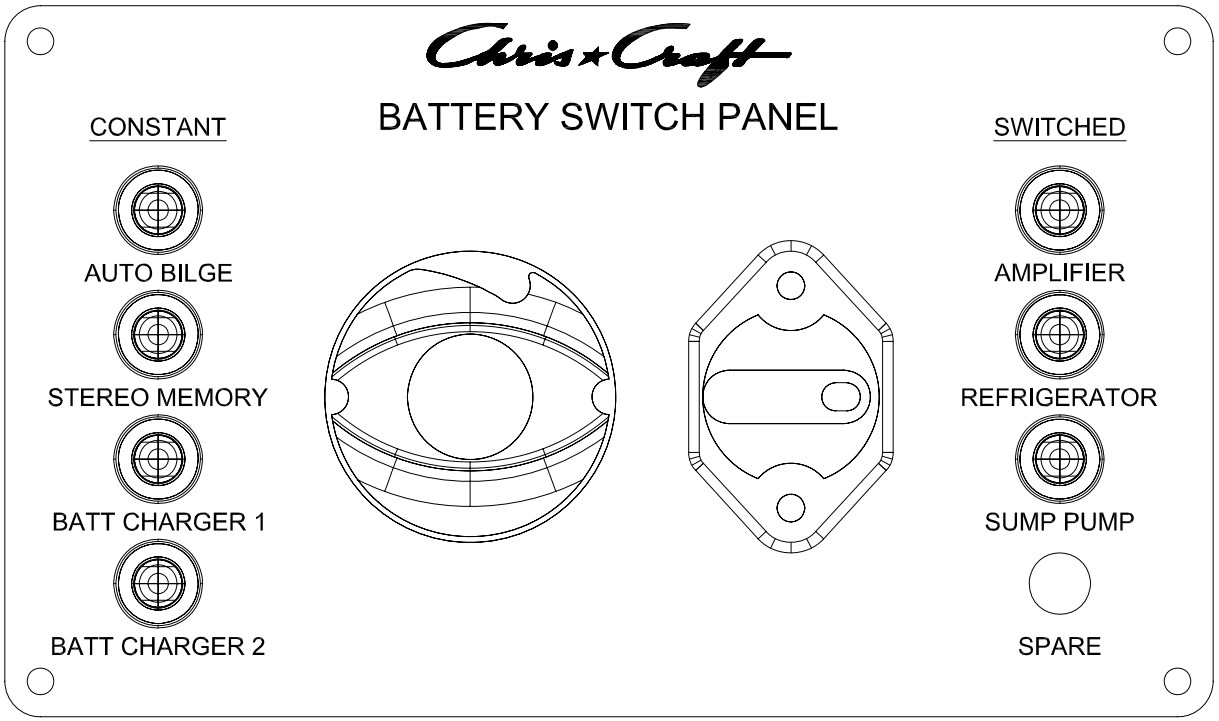


Figure 22. Launch 25 – Starboard Switch Panel

LAUNCH 25 BATTERY SWITCH PANEL



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
AUTO BILGE PUMP	5 AMPS	BATTERY SWITCH		AMPLIFIER	15 AMPS
STEREO MEMORY	10 AMPS	MAIN	40 AMPS	REFRIGERATOR (OPTIONS)	5 AMPS
BATTERY CHARGER 1 (OPT)	20 AMPS			SUMP PUMP	5 AMPS
BATTERY CHARGER 2 (OPT)	20 AMPS			SPARE	NOT USED

Figure 23. Launch 25 – Battery Switch Panel

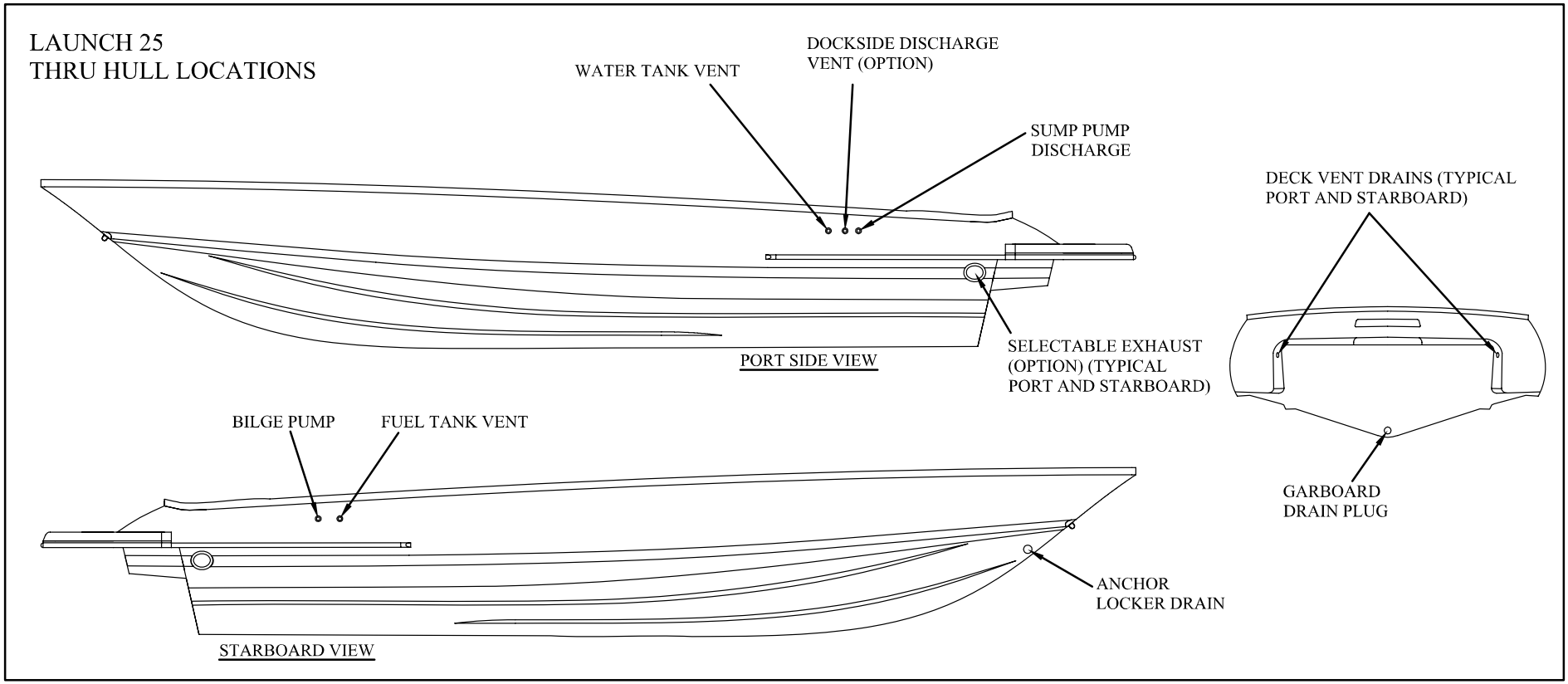
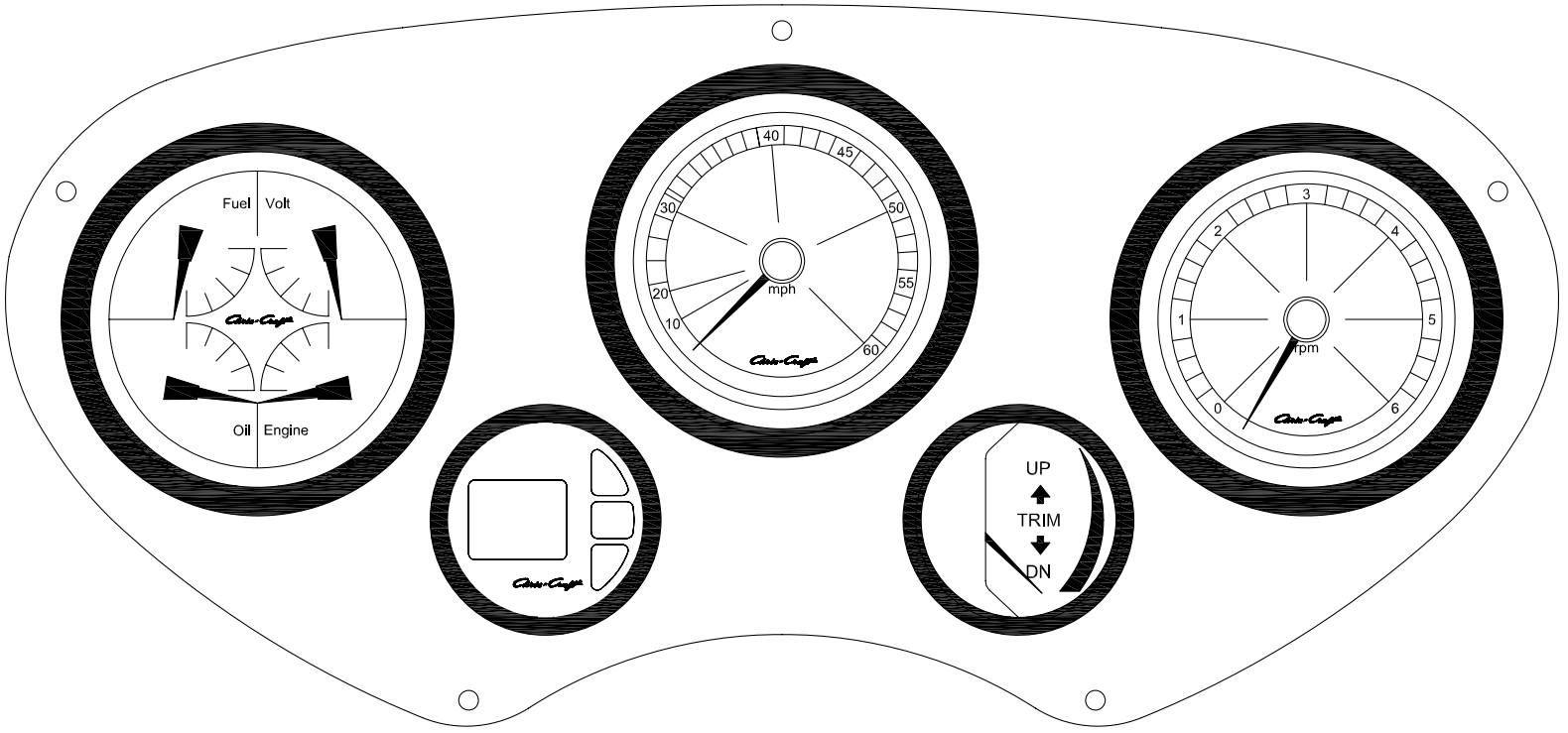


Figure 24. Launch 25 – Thru-Hull Locations

LAUNCH 25 INSTRUMENT PANEL



PART DESCRIPTION
4" 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
2" DEPTH SOUNDER
4" SPEEDOMETER (0-60 MPH)
2" DRIVE TRIM INDICATOR
4 " TACHOMETER (0-6000 RPM)

Figure 25. Launch 25 – Instrument Panel

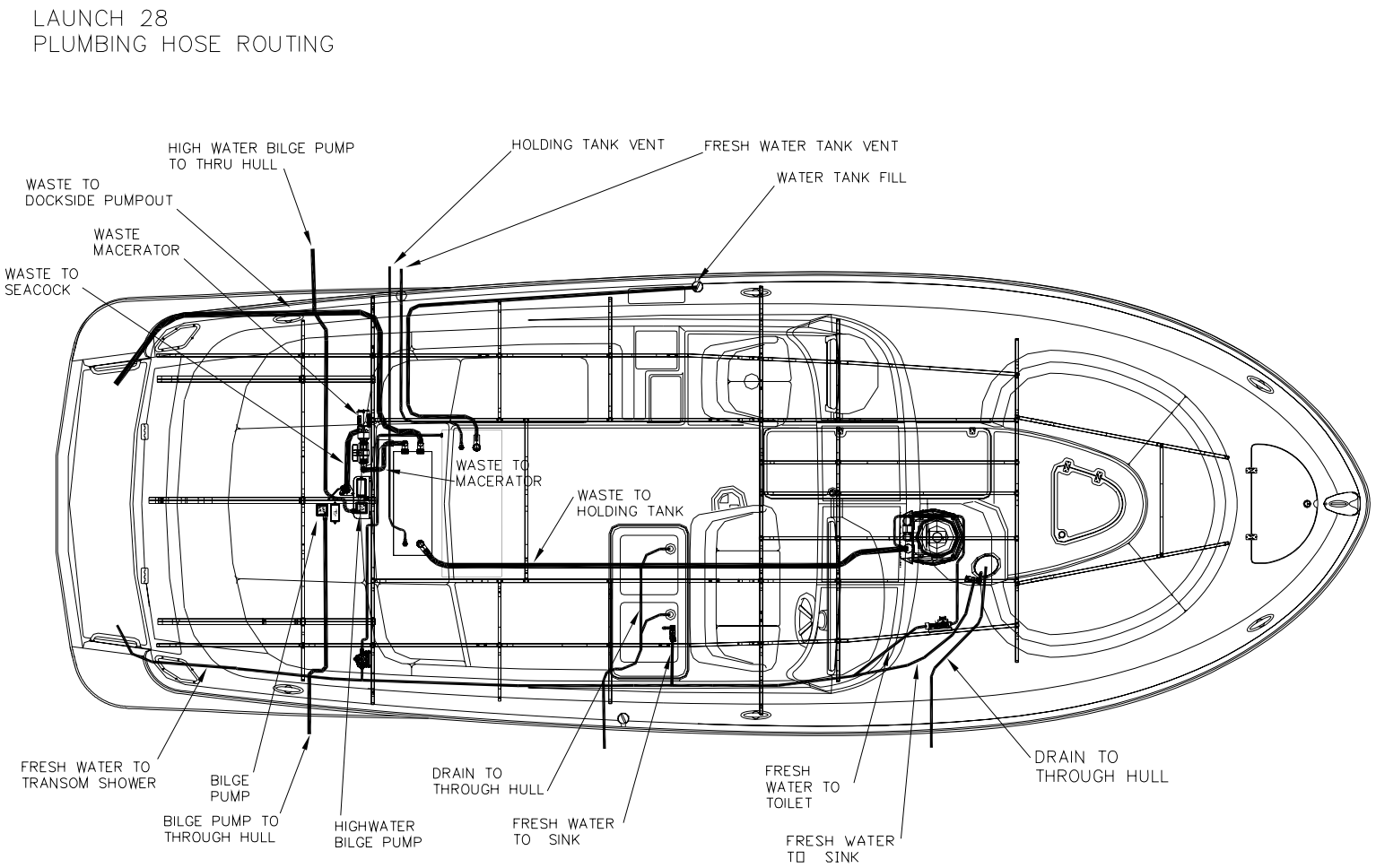
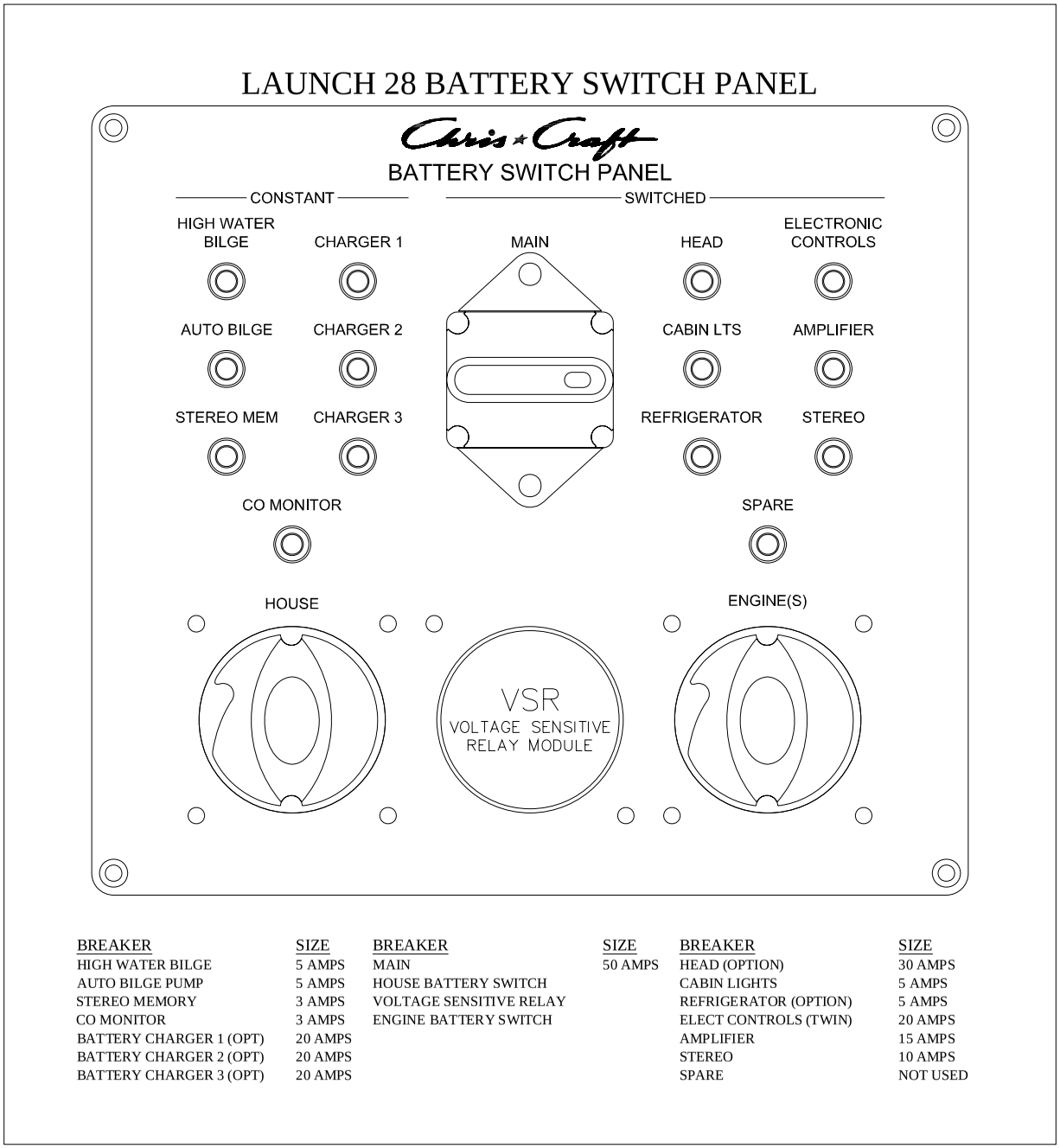
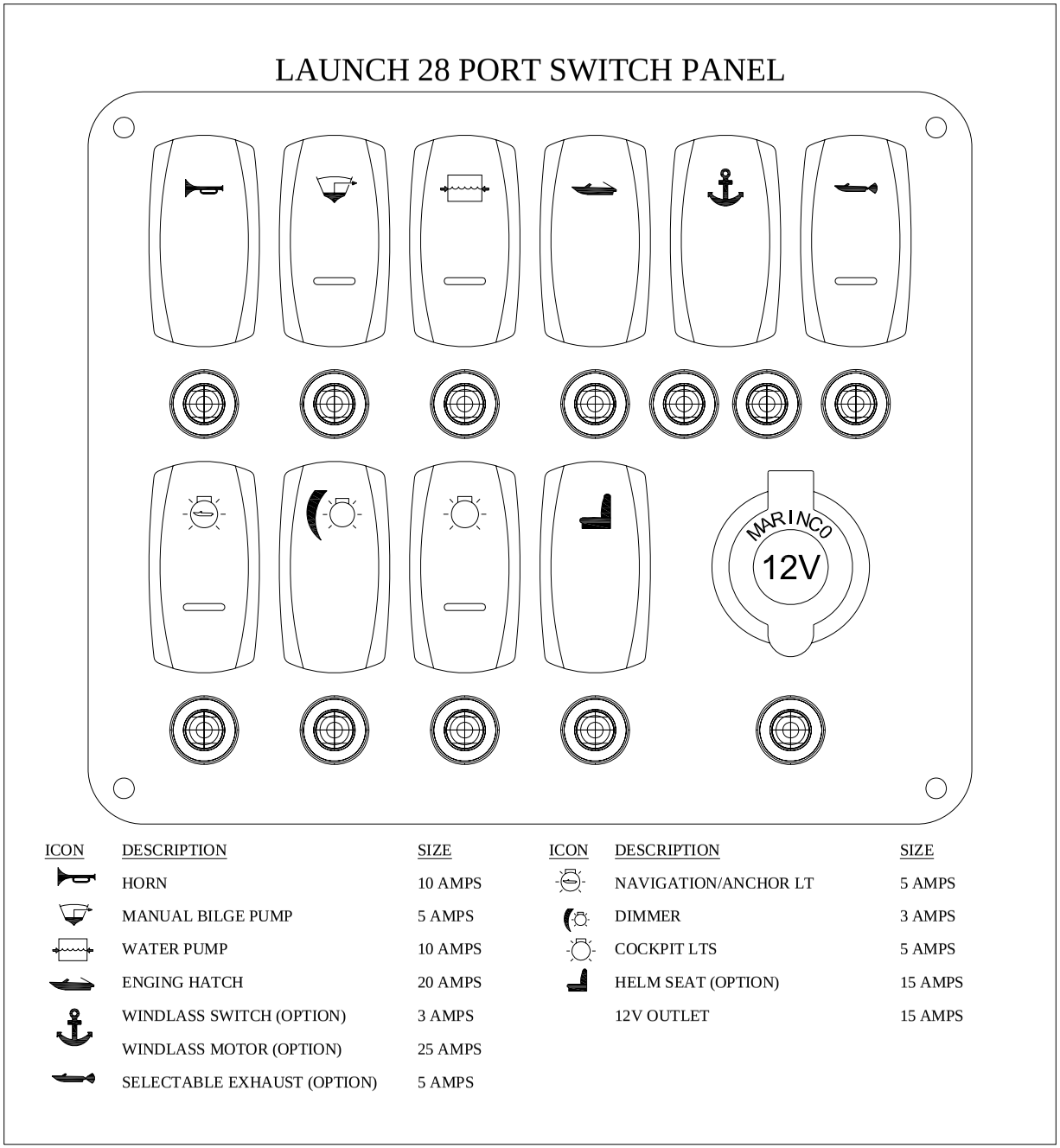


Figure 26. Launch 28 – Plumbing Hose Route



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
HIGH WATER BILGE	5 AMPS	MAIN	50 AMPS	HEAD (OPTION)	30 AMPS
AUTO BILGE PUMP	5 AMPS	HOUSE BATTERY SWITCH		CABIN LIGHTS	5 AMPS
STEREO MEMORY	3 AMPS	VOLTAGE SENSITIVE RELAY		REFRIGERATOR (OPTION)	5 AMPS
CO MONITOR	3 AMPS	ENGINE BATTERY SWITCH		ELECT CONTROLS (TWIN)	20 AMPS
BATTERY CHARGER 1 (OPT)	20 AMPS			AMPLIFIER	15 AMPS
BATTERY CHARGER 2 (OPT)	20 AMPS			STEREO	10 AMPS
BATTERY CHARGER 3 (OPT)	20 AMPS			SPARE	NOT USED

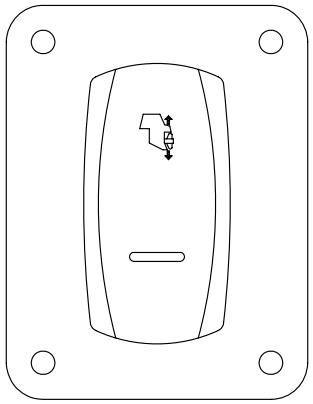
Figure 27. Launch 28 – Battery Switch Panel



ICON	DESCRIPTION	SIZE	ICON	DESCRIPTION	SIZE
	HORN	10 AMPS		NAVIGATION/ANCHOR LT	5 AMPS
	MANUAL BILGE PUMP	5 AMPS		DIMMER	3 AMPS
	WATER PUMP	10 AMPS		COCKPIT LTS	5 AMPS
	ENGING HATCH	20 AMPS		HELM SEAT (OPTION)	15 AMPS
	WINDLASS SWITCH (OPTION)	3 AMPS		12V OUTLET	15 AMPS
	WINDLASS MOTOR (OPTION)	25 AMPS			
	SELECTABLE EXHAUST (OPTION)	5 AMPS			

Figure 28. Launch 28 – Port Switch Panel

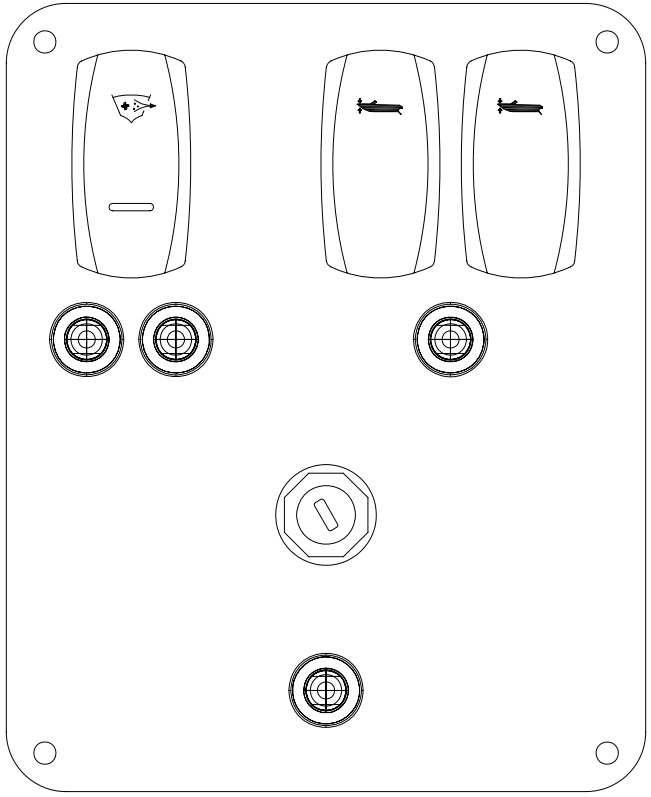
LAUNCH 28 SINGLE DRIVE TRIM PANEL



ICON	DESCRIPTION
	DRIVE TRIM SWITCH

Figure 29. Launch 28 – Single Drive Trim Panel

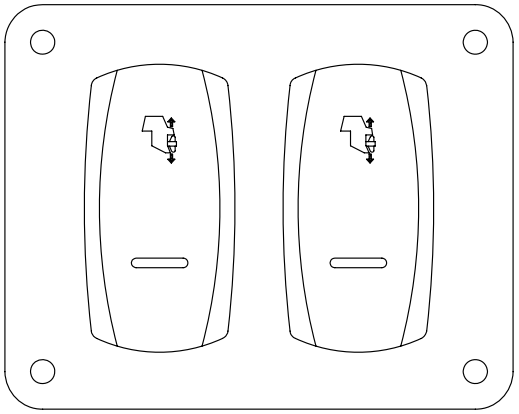
LAUNCH 28 SINGLE SWITCH PANEL



ICON	DESCRIPTION	SIZE
	PORT ENGINE ROOM BLOWER	10 AMPS
	STBD ENGINE ROOM BLOWER	10 AMPS
	TRIM TAB (PORT BOW DOWN)	20AMPS
	TRIM TAB (STBD BOW DOWN)	
	IGNITION KEY SWITCH	10 AMPS

Figure 30. Launch 28 – Single Switch Panel

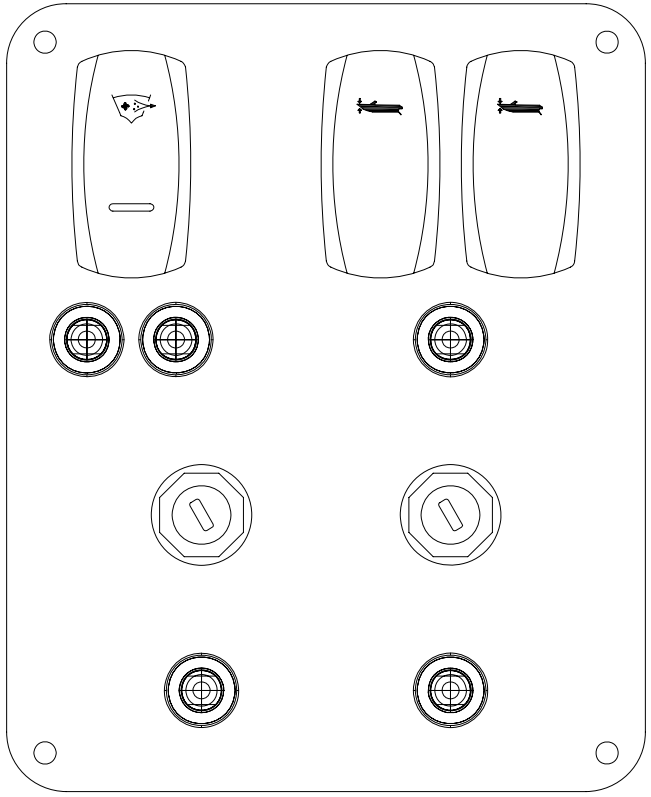
LAUNCH 28 TWIN DRIVE TRIM PANEL



ICON	DESCRIPTION
	PORT DRIVE TRIM SWITCH
	STBD DRIVE TRIM SWITCH

Figure 31. Launch 28 – Twin Drive Trim Panel

LAUNCH 28 TWIN SWITCH PANEL



ICON	DESCRIPTION	SIZE
	PORT ENGINE ROOM BLOWER	10 AMPS
	STBD ENGINE ROOM BLOWER	10 AMPS
	TRIM TAB (PORT BOW DOWN)	20AMPS
	TRIM TAB (STBD BOW DOWN)	
	PORT IGNITION KEY SWITCH	10 AMPS
	STBD IGNITION KEY SWITCH	10 AMPS

Figure 32. Launch 28 – Twin Switch Panel

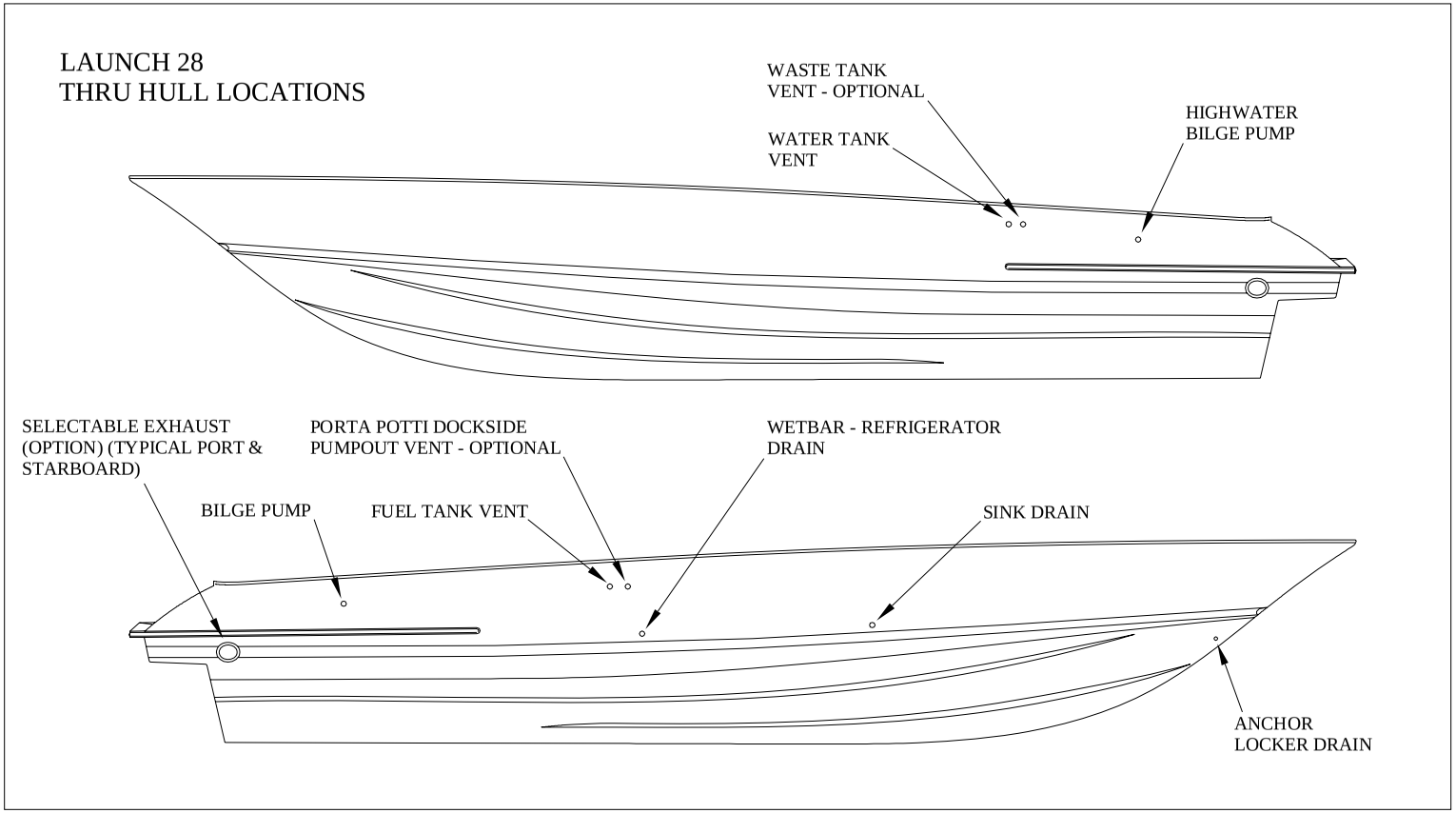
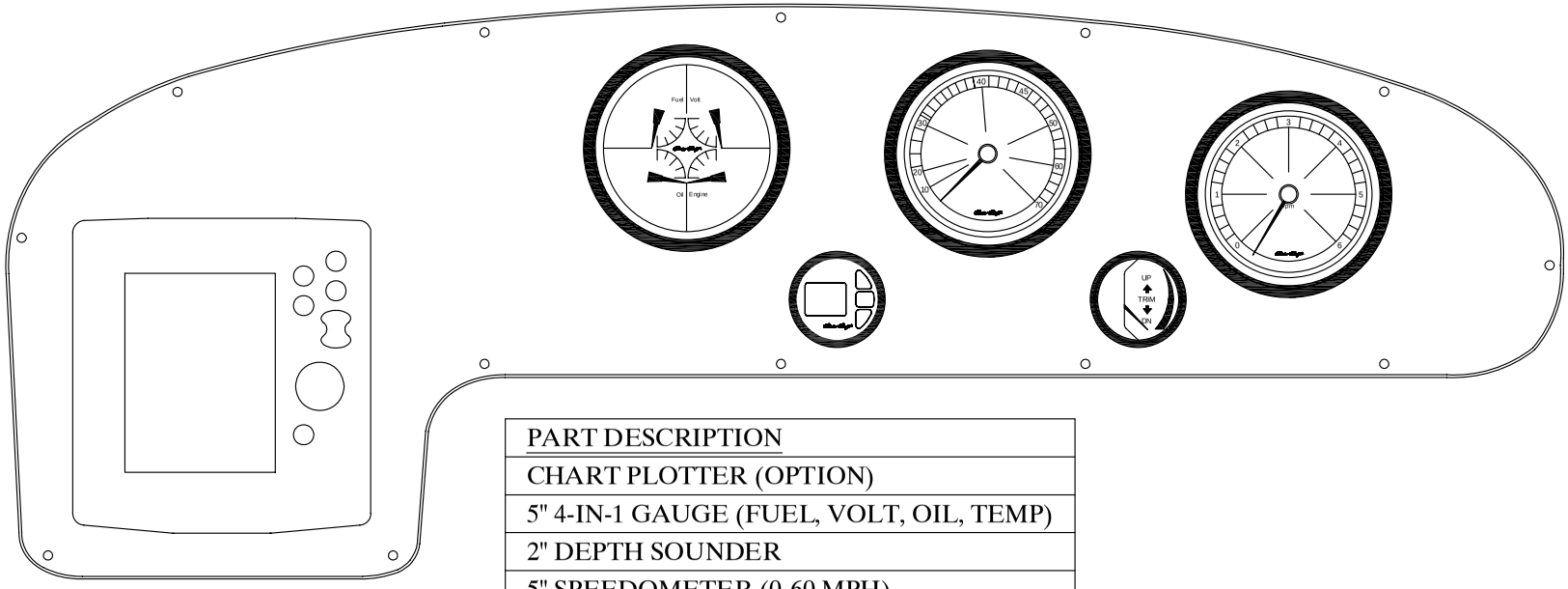


Figure 33. Launch 28 – Thru-Hull Locations

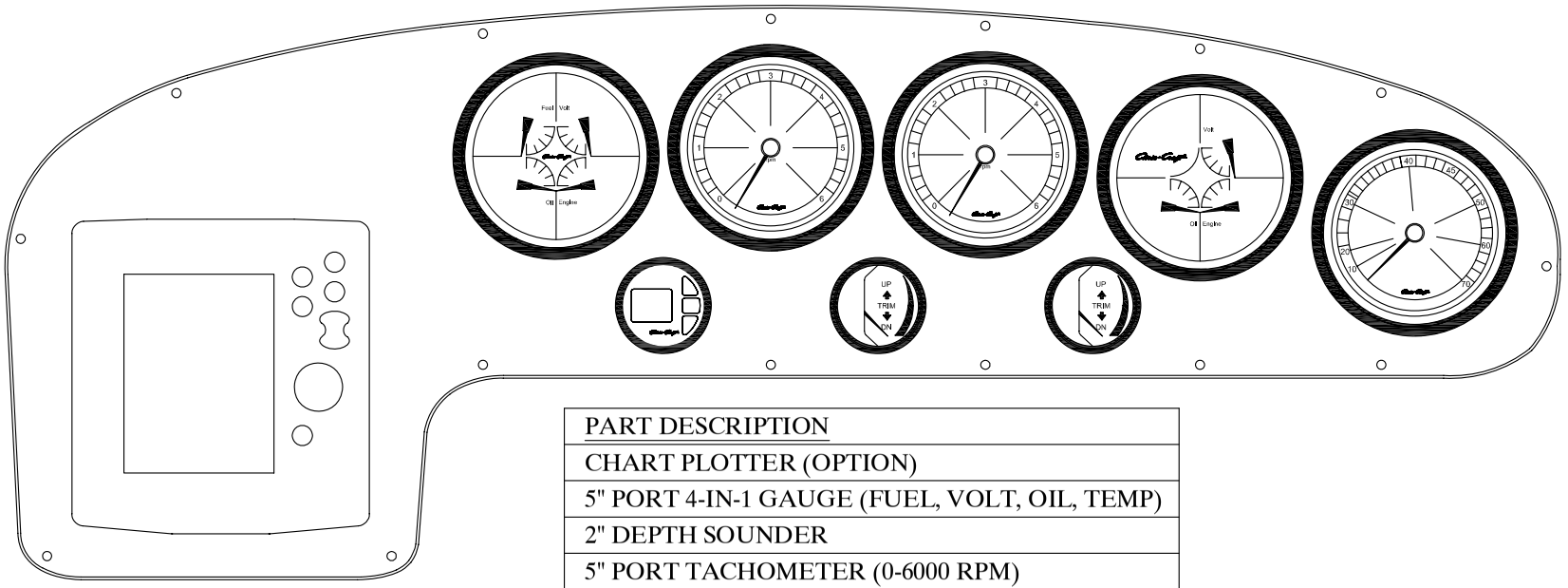
LAUNCH 28 SINGLE INSTRUMENT PANEL



PART DESCRIPTION
CHART PLOTTER (OPTION)
5" 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
2" DEPTH SOUNDER
5" SPEEDOMETER (0-60 MPH)
2" DRIVE TRIM INDICATOR
5 " TACHOMETER (0-6000 RPM)

Figure 34. Launch 28 – Single Instrument Panel

LAUNCH 28 TWIN INSTRUMENT PANEL



PART DESCRIPTION
CHART PLOTTER (OPTION)
5" PORT 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
2" DEPTH SOUNDER
5" PORT TACHOMETER (0-6000 RPM)
2" PORT DRIVE TRIM INDICATOR
5" STBD TACHOMETER (0-6000 RPM)
2" STBD DRIVE TRIM INDICATOR
5" STBD 3-IN-1 GAUGE (VOLT, OIL, TEMP)
5" SPEEDOMETER (0-60 MPH)

Figure 35. Launch 28 – Twin Engine Instrument Panel

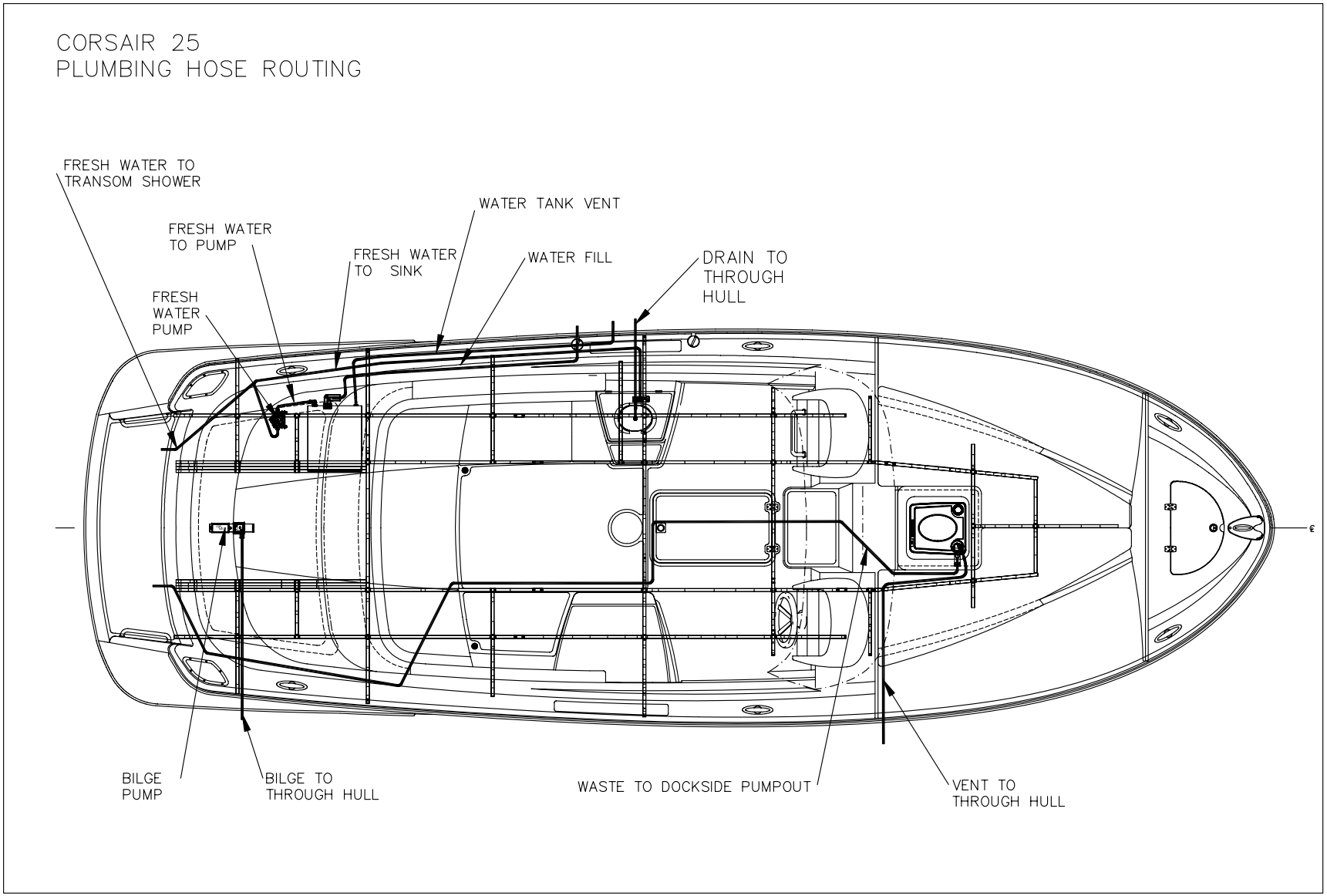


Figure 36. Corsair 25 – Plumbing Hose Routing

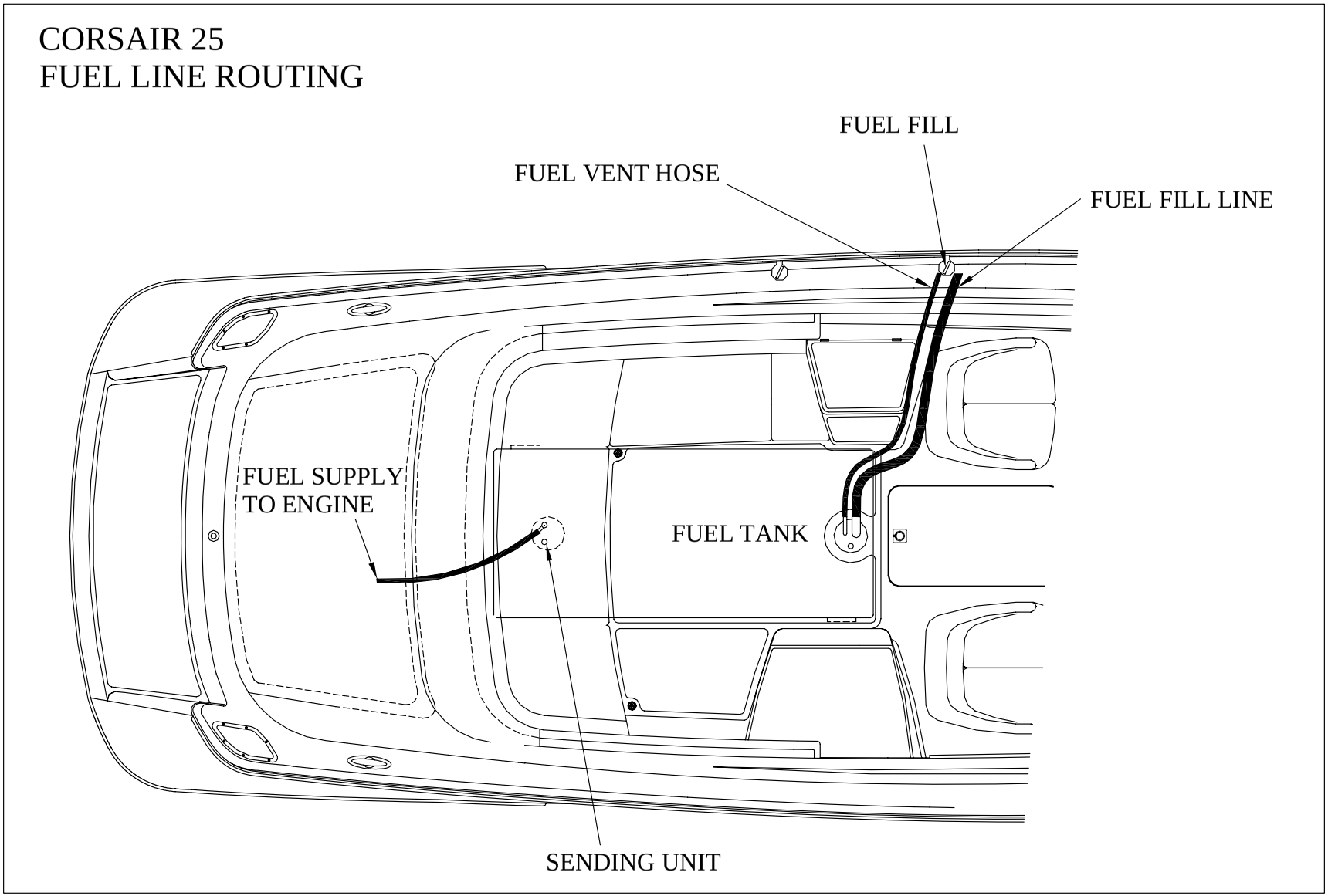
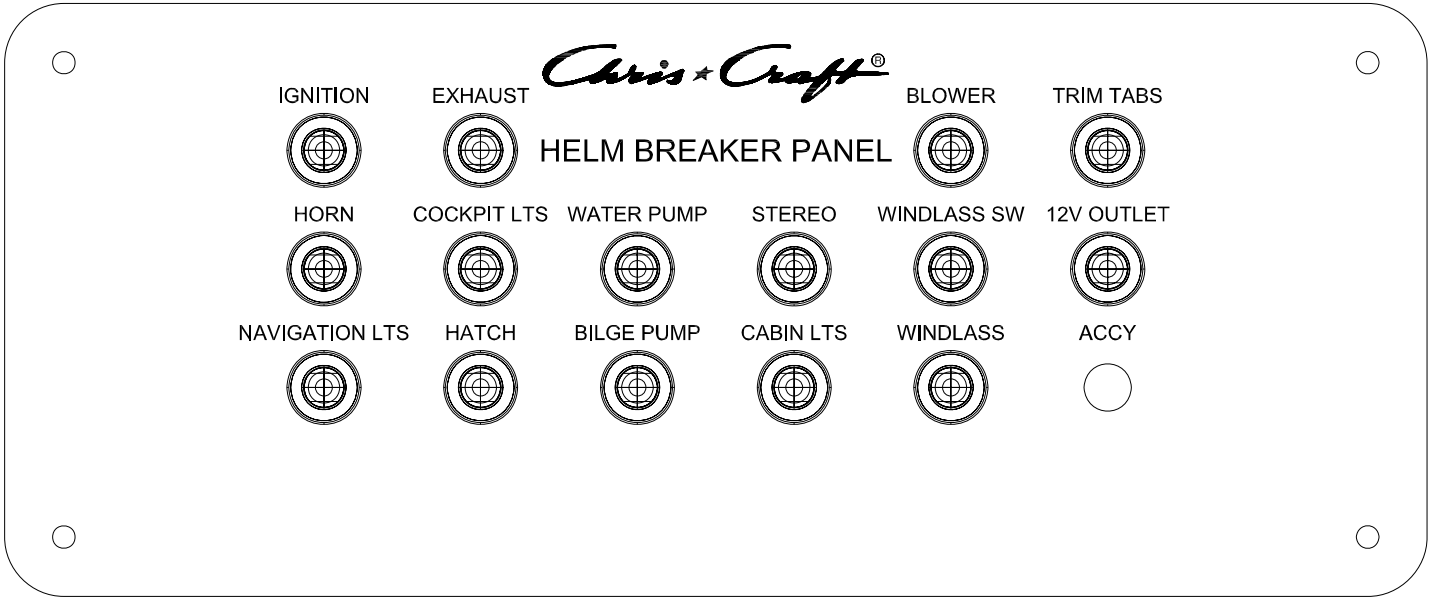


Figure 37. Corsair 25 – Fuel Hose Routing

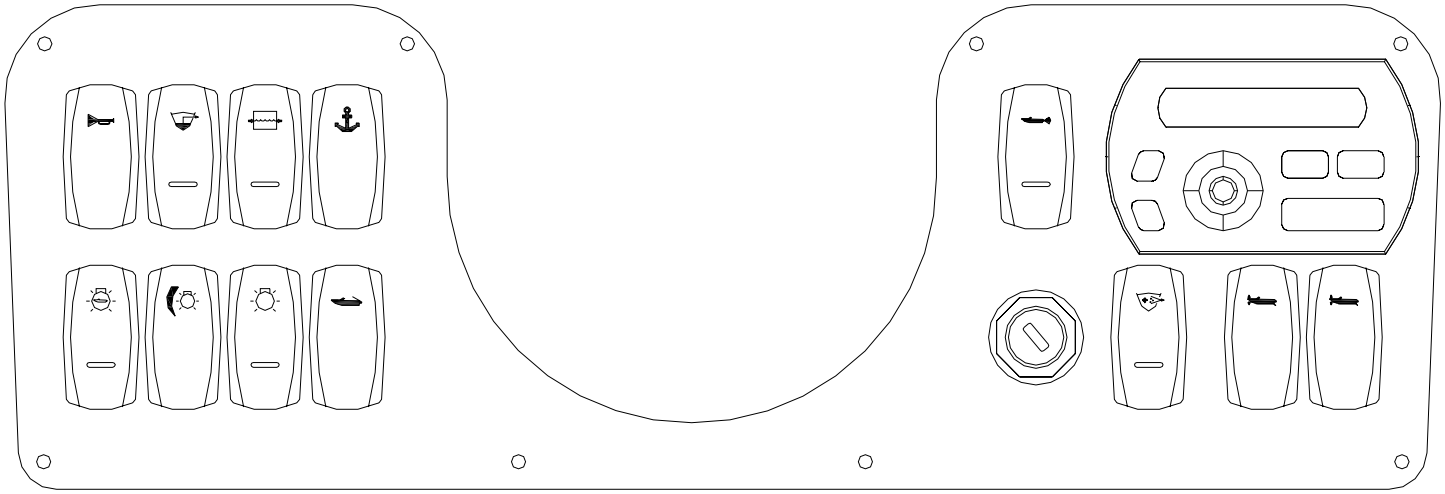
CORSAIR 25 HELM BREAKER PANEL



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
IGNITION	10 AMPS	WATER PUMP	10 AMPS	WINDLASS SW (OPT)	3 AMPS
HORN	7 AMPS	MANUAL BILGE PUMP	5 AMPS	WINDLASS (OPTION)	25 AMPS
NAVIGATION LT	5 AMPS	STEREO	3 AMPS	TRIM TABS	20 AMPS
EXHAUST (OPTION)	3 AMPS	CABIN LTS	5 AMPS	12V OUTLET	15 AMPS
COCKPIT LTS	5 AMPS	BLOWER	7 AMPS	ACCY	NOT USED
ENGINE HATCH	20 AMPS				

Figure 38. Corsair 25 – Helm Breaker Panel

CORSAIR 25 HELM SWITCH PANEL

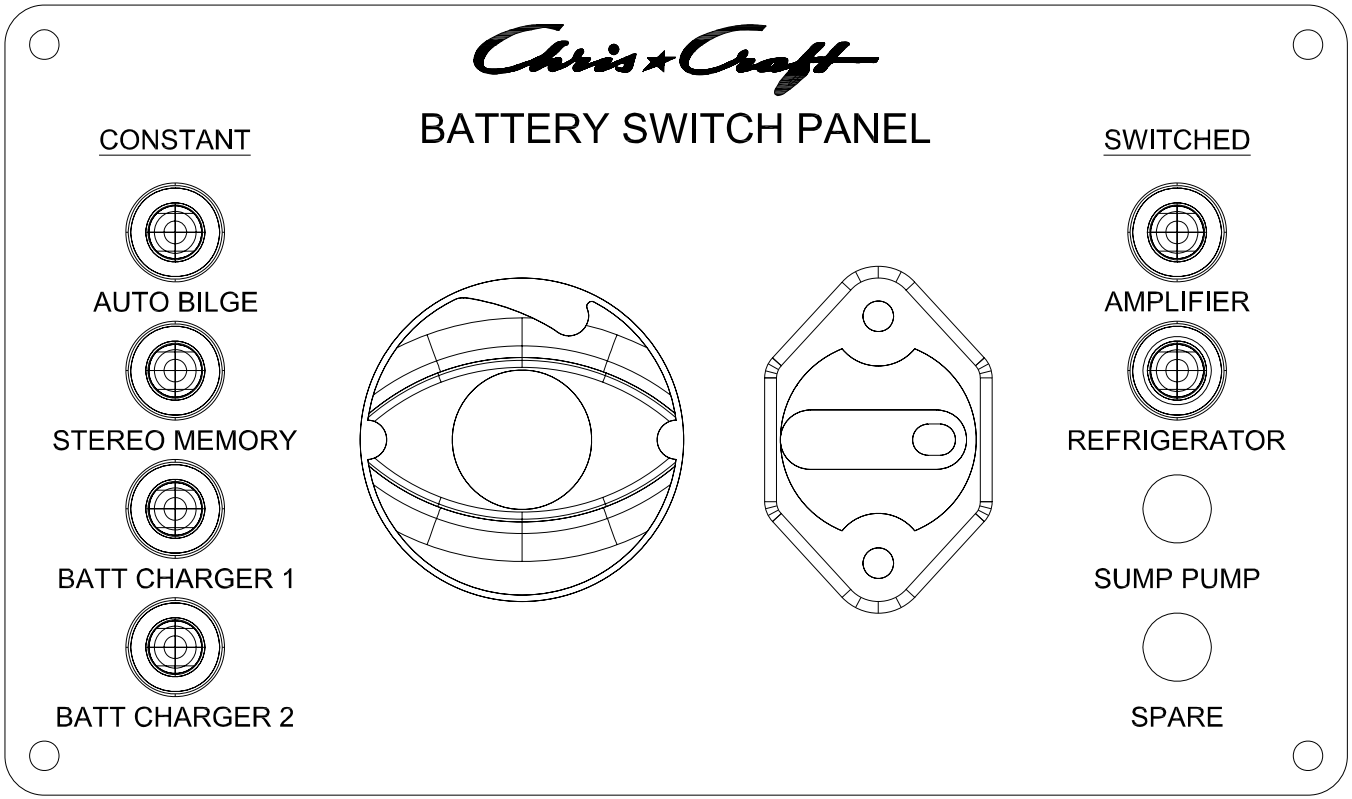


ICON	DESCRIPTION
	HORN
	MANUAL BILGE PUMP
	WATER PUMP
	WINDLASS (OPTION)
	NAVIGATION/ANCHOR LIGHT
	DIMMER
	COCKPIT LIGHT

ICON	DESCRIPTION
	ENGINE HATCH
	SELECTABLE EXHAUST (OPTION)
	STEREO REMOTE
	IGNITION KEY SWITCH
	ENGINE ROOM BLOWERS
	TRIM TAB (PORT BOW CONTROL)
	TRIM TAB (STBD BOW CONTROL)

Figure 39. Corsair 25 – Helm Switch Panel

CORSAIR 25 BATTERY SWITCH PANEL



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
AUTO BILGE PUMP	5 AMPS	BATTERY SWITCH		AMPLIFIER	15 AMPS
STEREO MEMORY	10 AMPS	MAIN	40 AMPS	REFRIGERATOR (OPTION)	5 AMPS
BATTERY CHARGER 1 (OPT)	20 AMPS			SUMP PUMP	NOT USED
BATTERY CHARGER 2 (OPT)	20 AMPS			SPARE	NOT USED

Figure 40. Corsair 25 – Battery Switch Panel

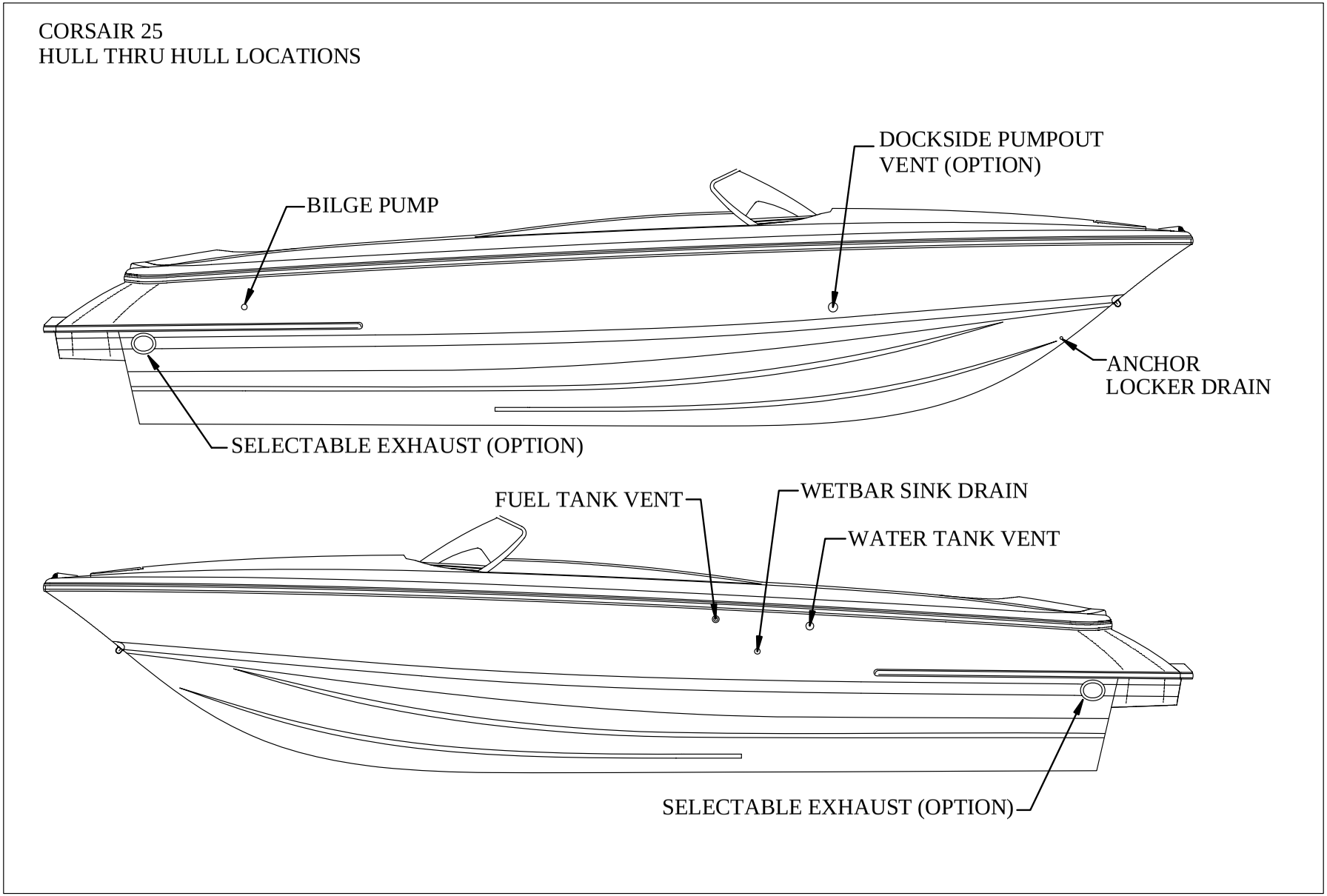
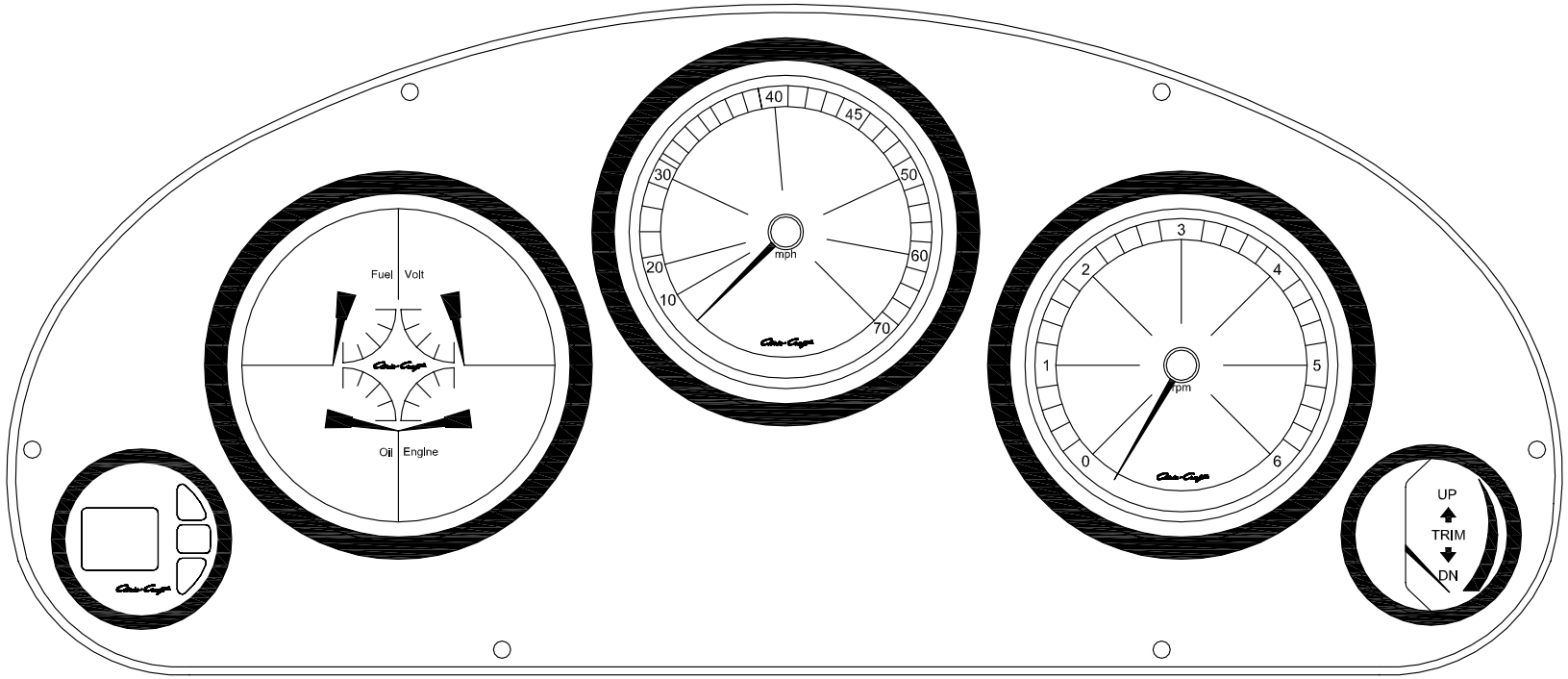


Figure 41. Corsair 25 – Thru-Hull Locations

CORSAIR 25 INSTRUMENT PANEL



PART DESCRIPTION
2" DEPTH SOUNDER
5" 4-IN-1 GAUGE (FUEL, VOLT, OIL, TEMP)
5" SPEEDOMETER (0-60 MPH)
5 " TACHOMETER (0-6000 RPM)
2" DRIVE TRIM INDICATOR

Figure 42. Corsair 25 – Instrument Panel

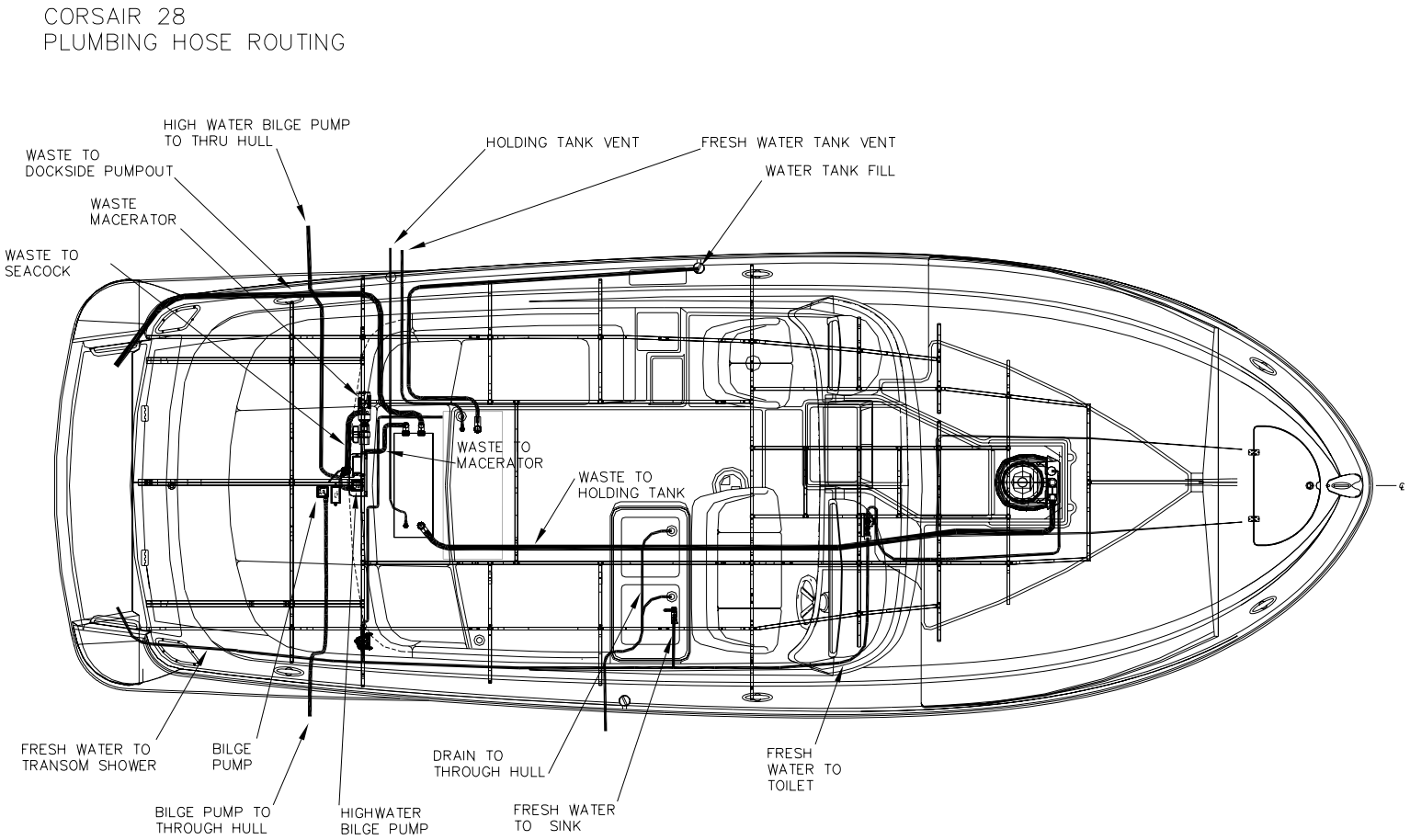
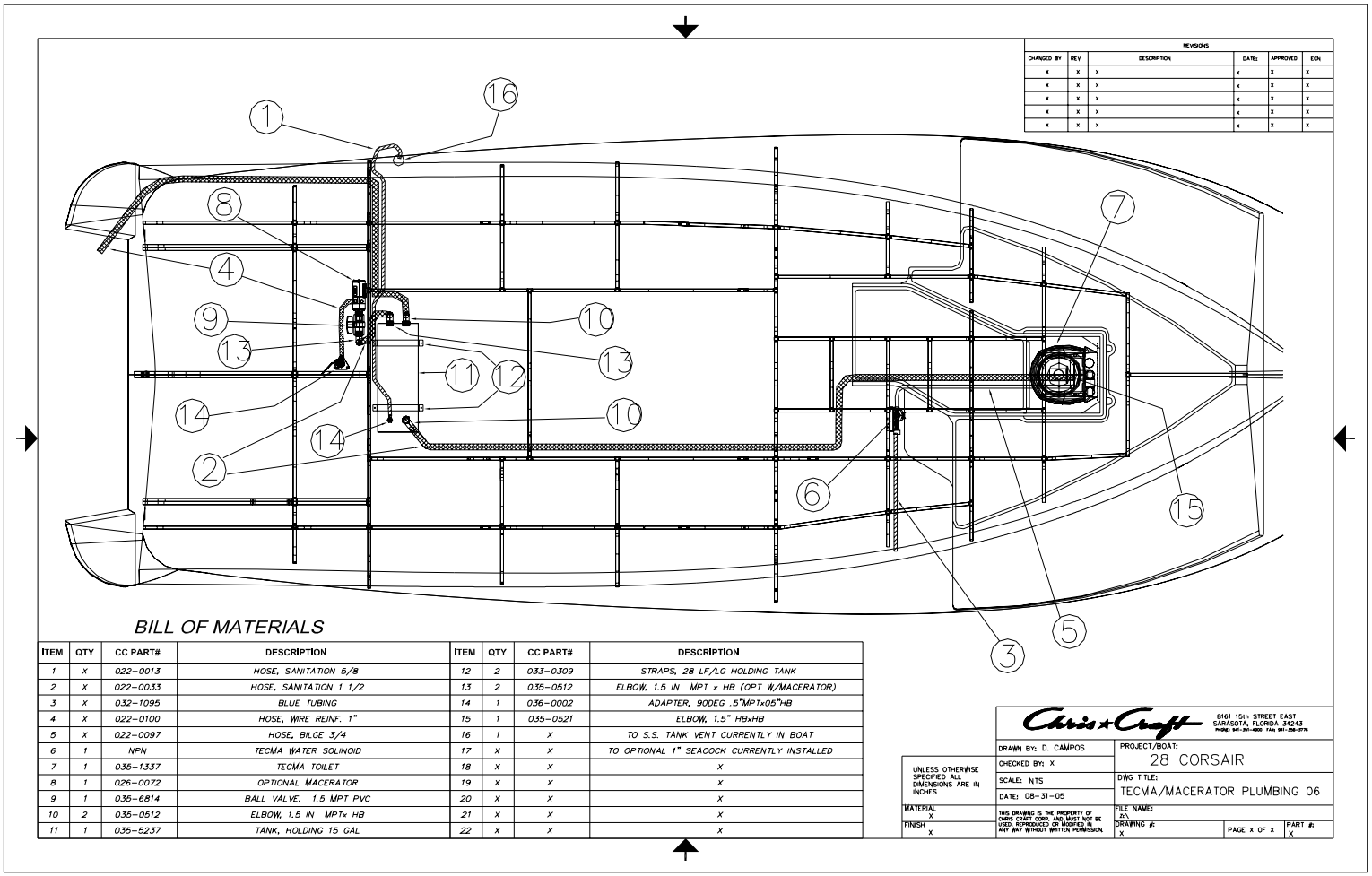


Figure 43. Corsair 28 – Plumbing Hose Routing (Sheet 1 of 2)



BILL OF MATERIALS

ITEM	QTY	CC PART#	DESCRIPTION	ITEM	QTY	CC PART#	DESCRIPTION
1	X	022-0013	HOSE, SANITATION 5/8	12	2	033-0309	STRAPS, 28 LF/LG HOLDING TANK
2	X	022-0033	HOSE, SANITATION 1 1/2	13	2	035-0512	ELBOW, 1.5 IN MPT x HB (OPT W/MACERATOR)
3	X	032-1095	BLUE TUBING	14	1	036-0002	ADAPTER, 90DEG .5"MPTx05"HB
4	X	022-0100	HOSE, WIRE REINF. 1"	15	1	035-0521	ELBOW, 1.5" HBxHB
5	X	022-0097	HOSE, BILGE 3/4	16	1	X	TO S.S. TANK VENT CURRENTLY IN BOAT
6	1	NPN	TECMA WATER SOLINOID	17	X	X	TO OPTIONAL 1" SEACOCK CURRENTLY INSTALLED
7	1	035-1337	TECMA TOILET	18	X	X	X
8	1	026-0072	OPTIONAL MACERATOR	19	X	X	X
9	1	035-6814	BALL VALVE, 1.5 MPT PVC	20	X	X	X
10	2	035-0512	ELBOW, 1.5 IN MPTx HB	21	X	X	X
11	1	035-5237	TANK, HOLDING 15 GAL	22	X	X	X

Chris-Craft 8161 15th STREET EAST SARASOTA, FLORIDA 34243 PHONE: 941-351-4800 FAX: 941-358-3778

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES

MATERIAL: X

FINISH: X

DRAWN BY: D. CAMPOS

CHECKED BY: X

SCALE: NTS

DATE: 08-31-05

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PROJECT/BOAT: 28 CORSAIR

DWG TITLE: TECMA/MACERATOR PLUMBING 06

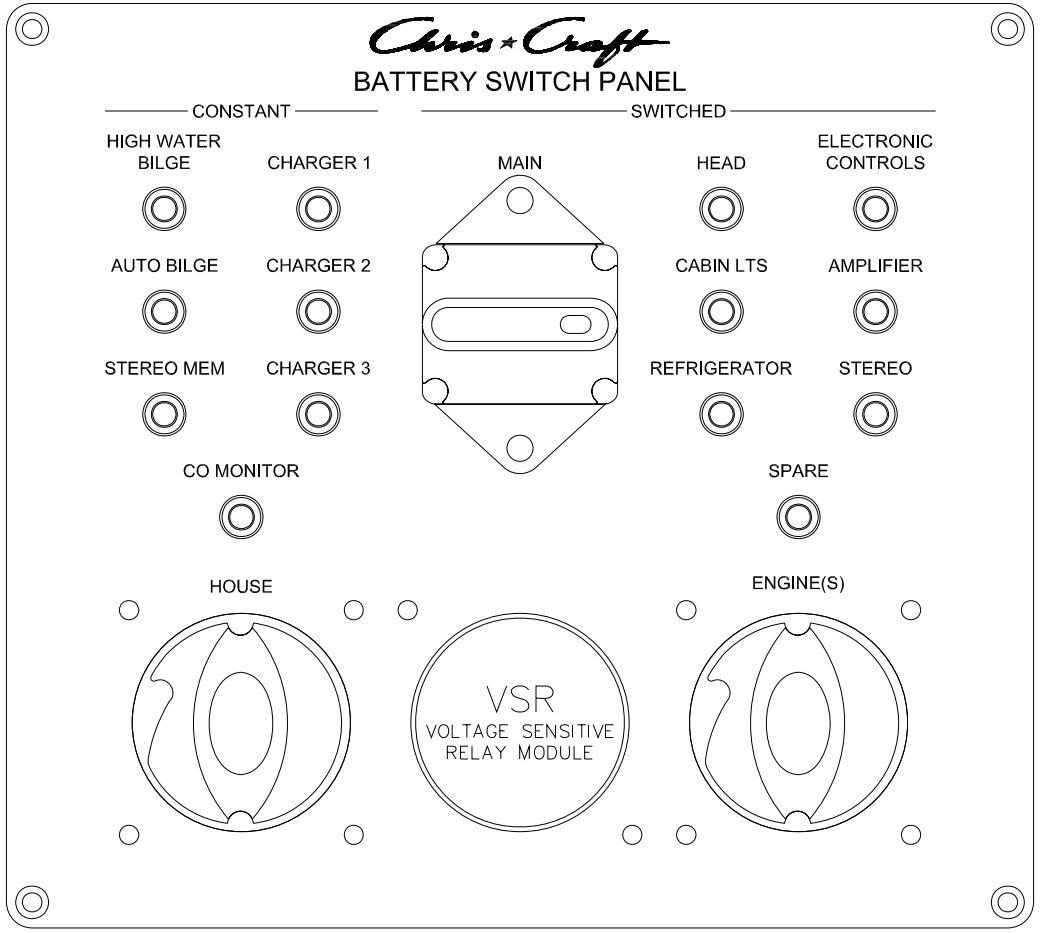
FILE NAME: Z:\

DRAWING #: X

PAGE X OF X

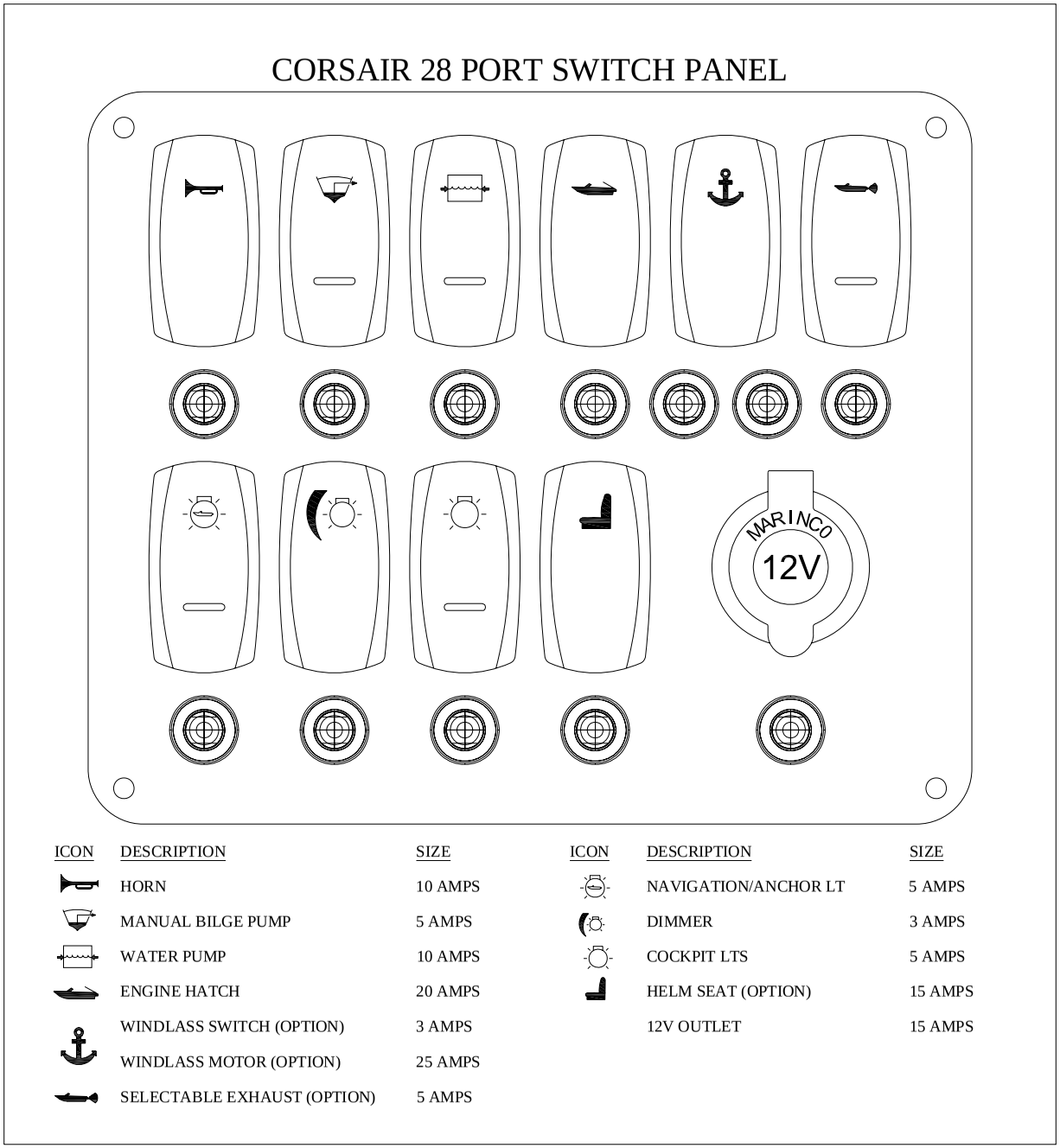
PART #: X

Figure 44. Corsair 28 – Plumbing Hose Routing (Sheet 2 of 2)



BREAKER	SIZE	BREAKER	SIZE	BREAKER	SIZE
HIGH WATER BILGE	5 AMPS	MAIN	50 AMPS	HEAD (OPTION)	30 AMPS
AUTO BILGE PUMP	5 AMPS	HOUSE BATTERY SWITCH		CABIN LIGHTS	5 AMPS
STEREO MEMORY	3 AMPS	VOLTAGE SENSITIVE RELAY		REFRIGERATOR (OPTION)	5 AMPS
CO MONITOR	3 AMPS	ENGINE BATTERY SWITCH		ELECT CONTROLS (TWIN)	20 AMPS
BATTERY CHARGER 1 (OPT)	20 AMPS			AMPLIFIER	15 AMPS
BATTERY CHARGER 2 (OPT)	20 AMPS			STEREO	10 AMPS
BATTERY CHARGER 3 (OPT)	20 AMPS			SPARE	NOT USED

Figure 45. Corsair 28 – Battery Switch Panel

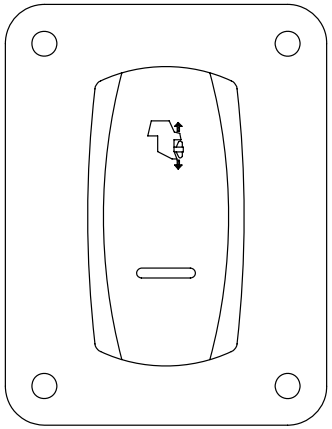


ICON	DESCRIPTION	SIZE
	HORN	10 AMPS
	MANUAL BILGE PUMP	5 AMPS
	WATER PUMP	10 AMPS
	ENGINE HATCH	20 AMPS
	WINDLASS SWITCH (OPTION)	3 AMPS
	WINDLASS MOTOR (OPTION)	25 AMPS
	SELECTABLE EXHAUST (OPTION)	5 AMPS

ICON	DESCRIPTION	SIZE
	NAVIGATION/ANCHOR LT	5 AMPS
	DIMMER	3 AMPS
	COCKPIT LTS	5 AMPS
	HELM SEAT (OPTION)	15 AMPS
	12V OUTLET	15 AMPS

Figure 46. Corsair 28 – Port Switch Panel

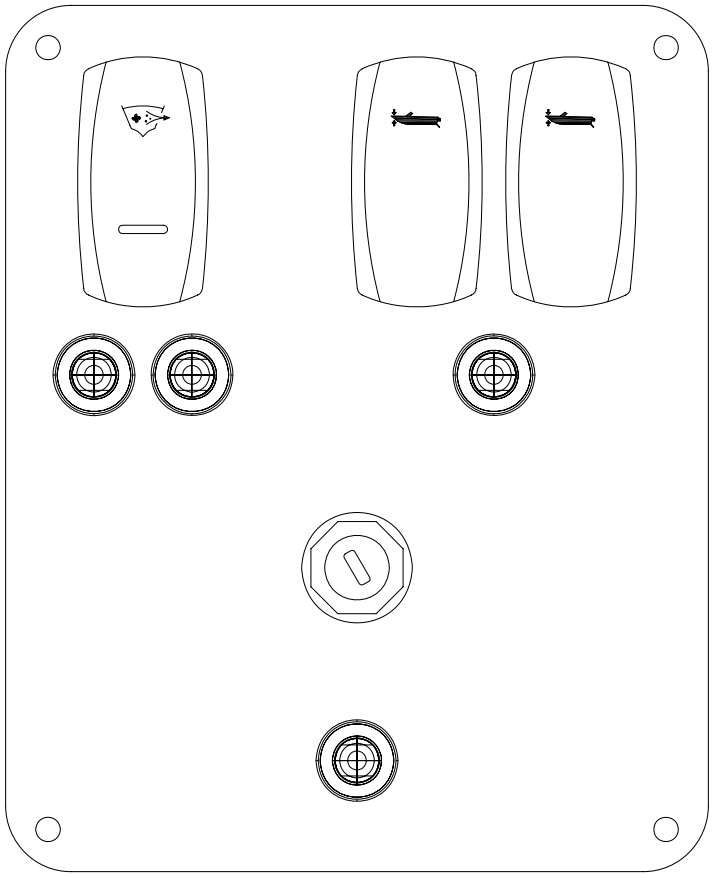
CORSAIR 28 SINGLE DRIVE TRIM PANEL



ICON	DESCRIPTION
	DRIVE TRIM SWITCH

Figure 47. Corsair 28 – Single Engine Drive Trim Panel

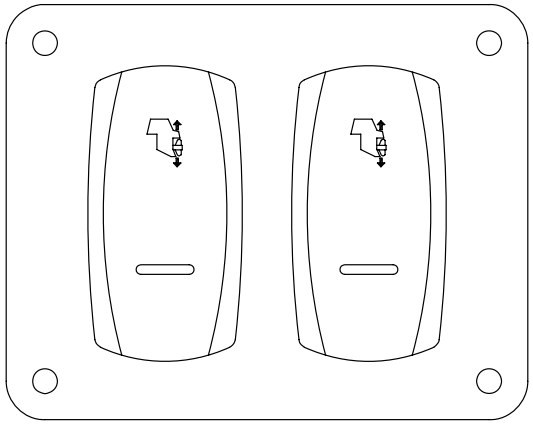
CORSAIR 28 SINGLE SWITCH PANEL



ICON	DESCRIPTION	SIZE
	PORT ENGINE ROOM BLOWER	10 AMPS
	STBD ENGINE ROOM BLOWER	10 AMPS
	TRIM TAB (PORT BOW DOWN)	20AMPS
	TRIM TAB (STBD BOW DOWN)	
	IGNITION KEY SWITCH	10 AMPS

Figure 48. Corsair 28 – Single Engine Switch Panel

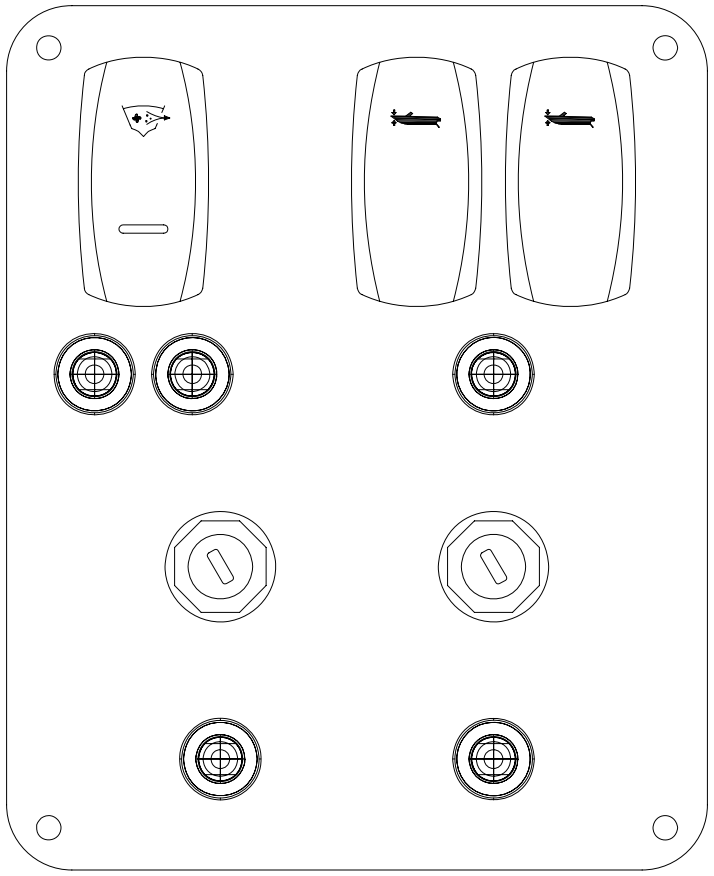
CORSAIR 28 TWIN DRIVE TRIM PANEL



ICON	DESCRIPTION
	PORT DRIVE TRIM SWITCH
	STBD DRIVE TRIM SWITCH

Figure 49. Corsair 28 – Twin Engine Drive Trim Panel

CORSAIR 28 TWIN SWITCH PANEL



ICON	DESCRIPTION	SIZE
	PORT ENGINE ROOM BLOWER	10 AMPS
	STBD ENGINE ROOM BLOWER	10 AMPS
	TRIM TAB (PORT BOW DOWN)	20AMPS
	TRIM TAB (STBD BOW DOWN)	
	PORT IGNITION KEY SWITCH	10 AMPS
	STBD IGNITION KEY SWITCH	10 AMPS

Figure 50. Corsair 28 – Twin Engine Switch Panel

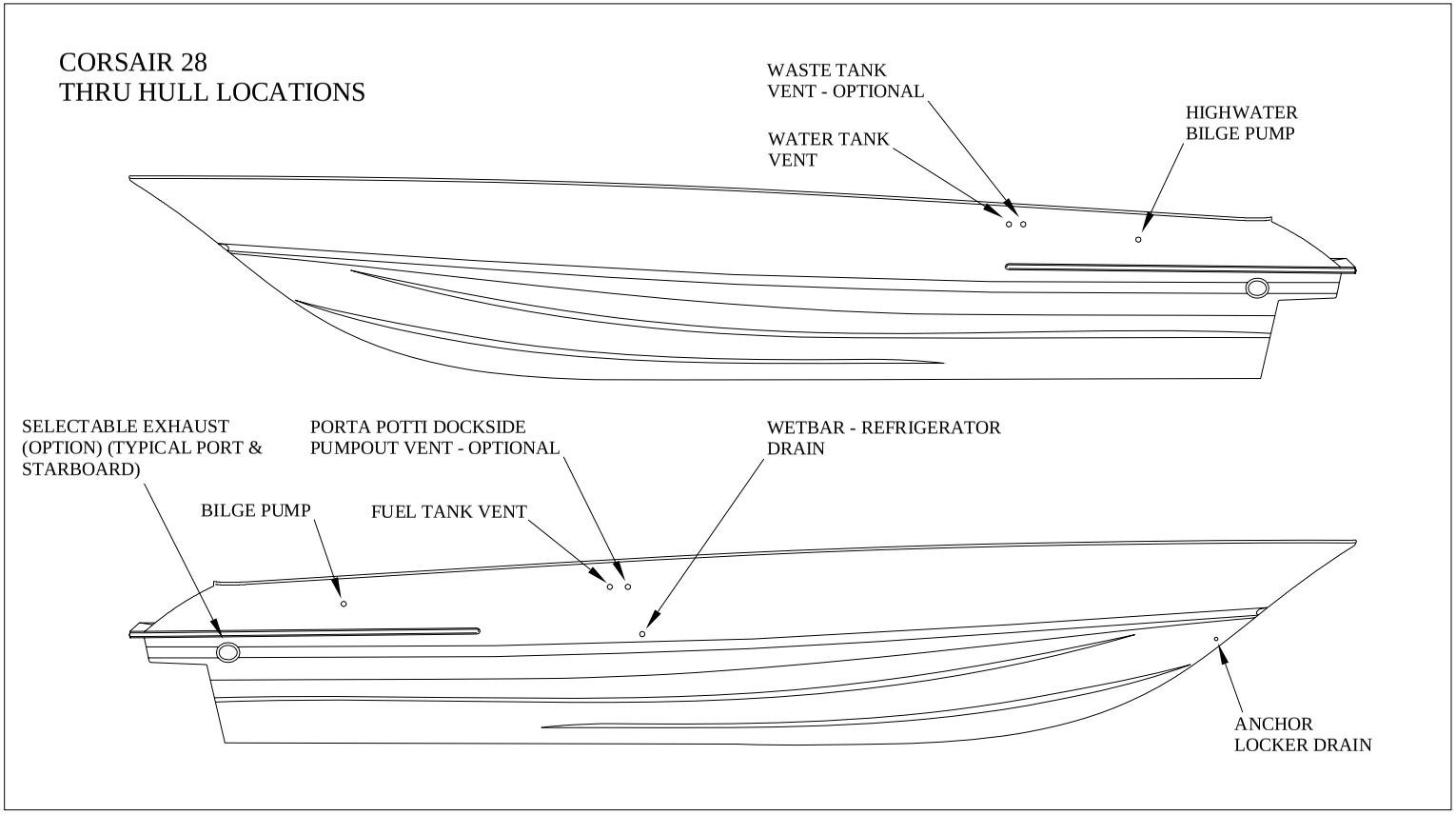


Figure 51. Corsair 28 – Thru-Hull Locations

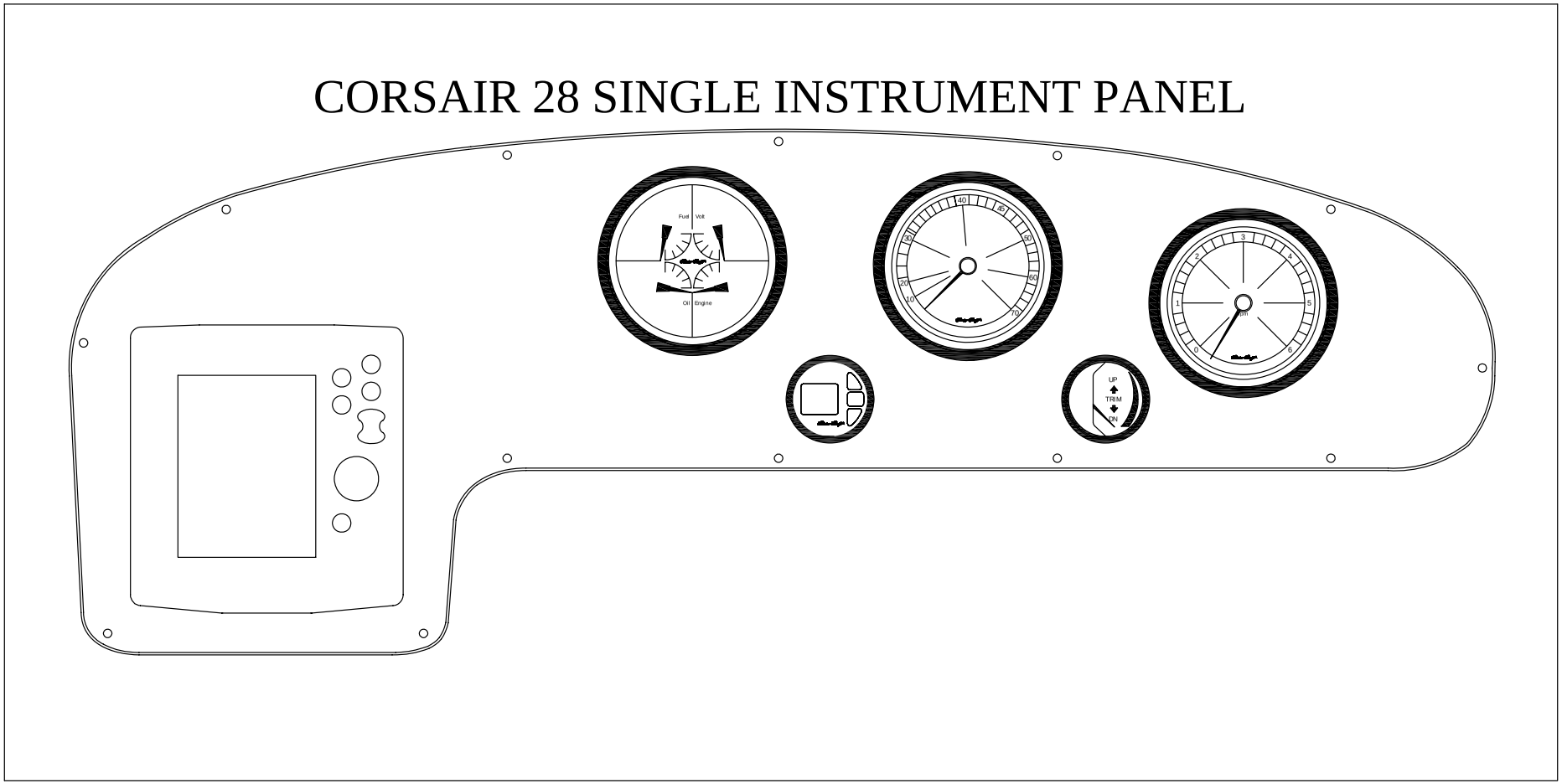


Figure 52. Corsair 28 – Single Engine Instrument Panel

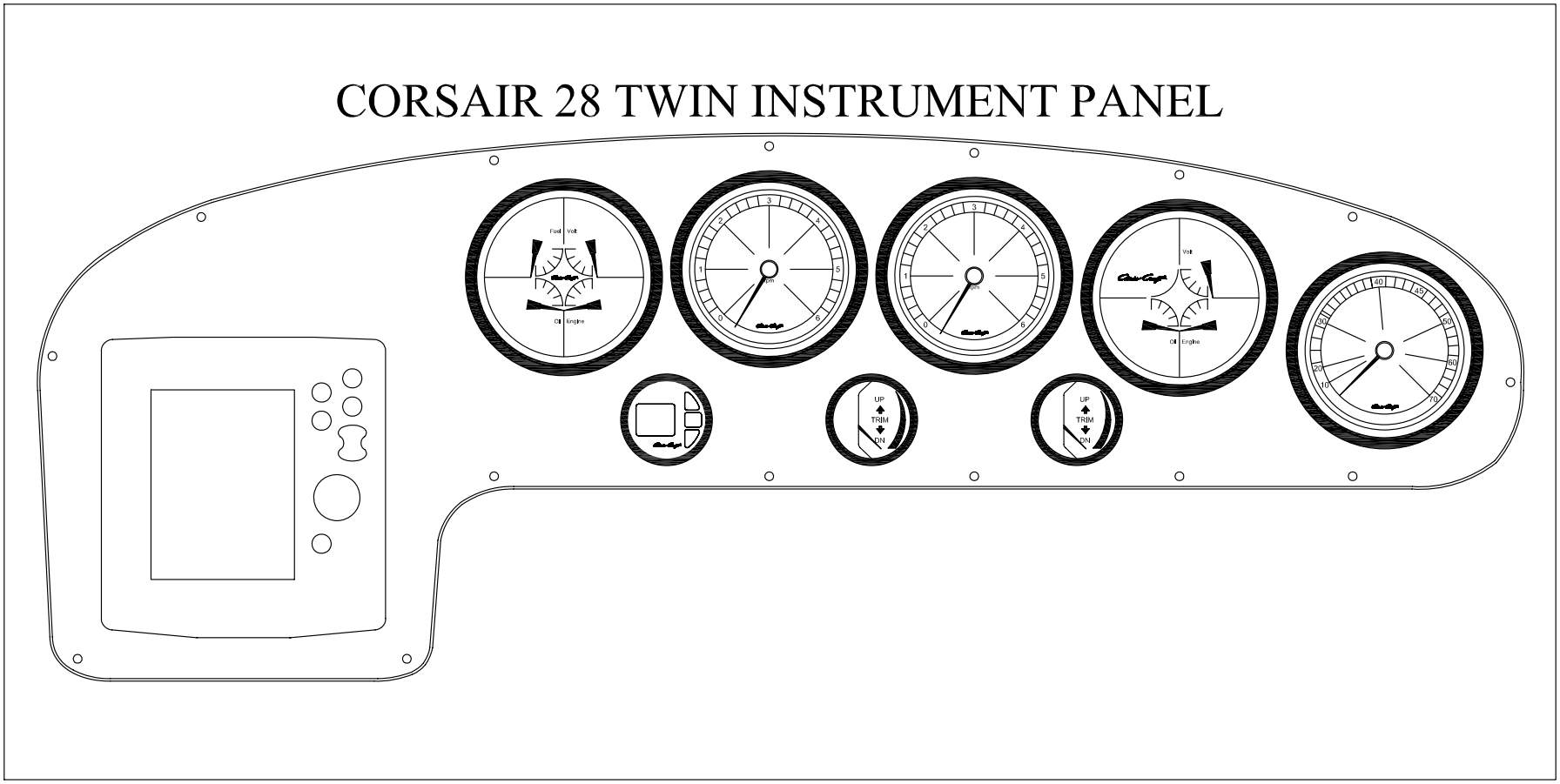


Figure 53. Corsair 28 – Twin Engine Instrument Panel

Lancer 20
Electrical Diagram
Page 1 of 2

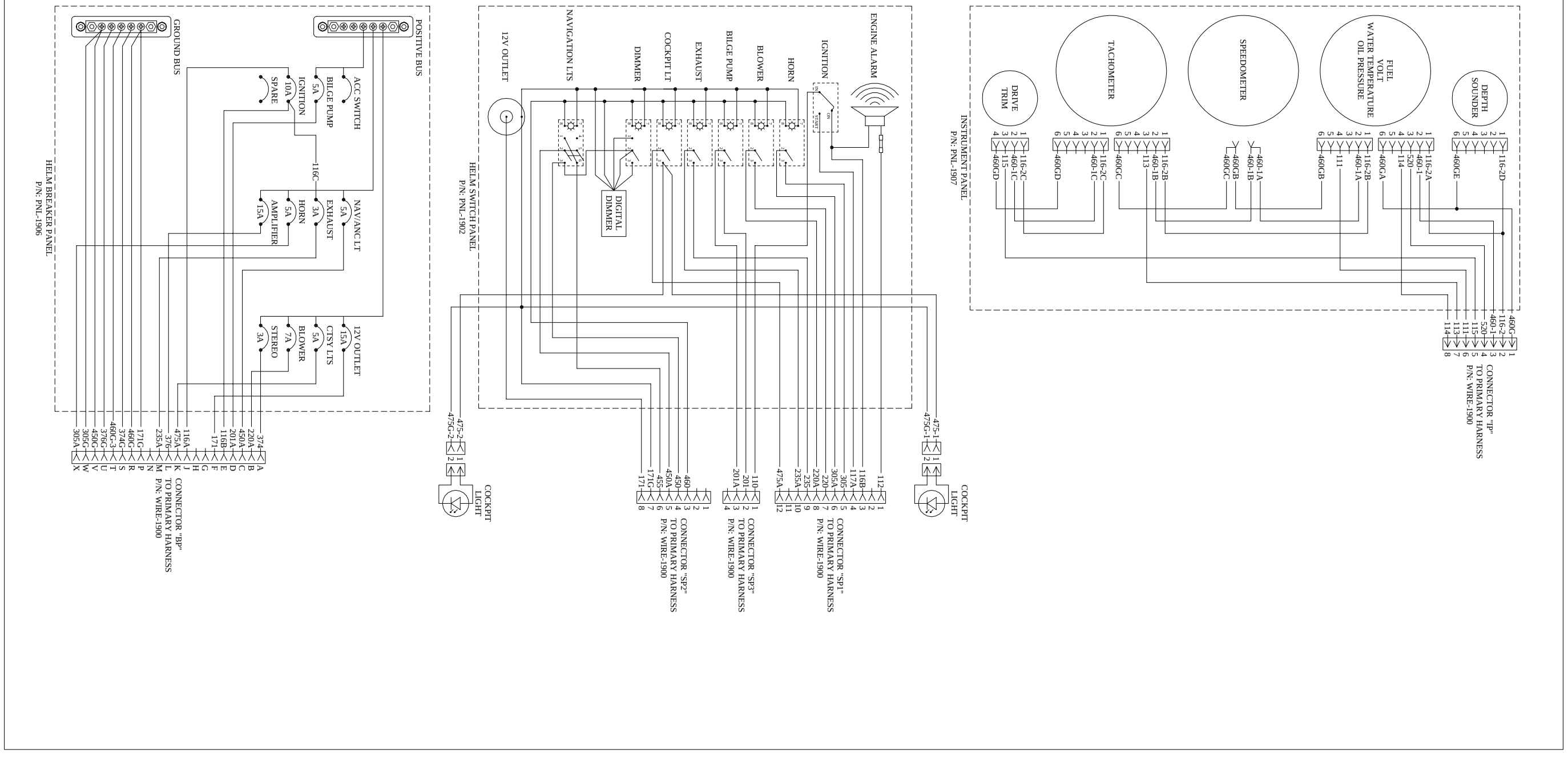


Figure 54. Lancer 20 Electrical Schematic (Sheet 1 of 2)

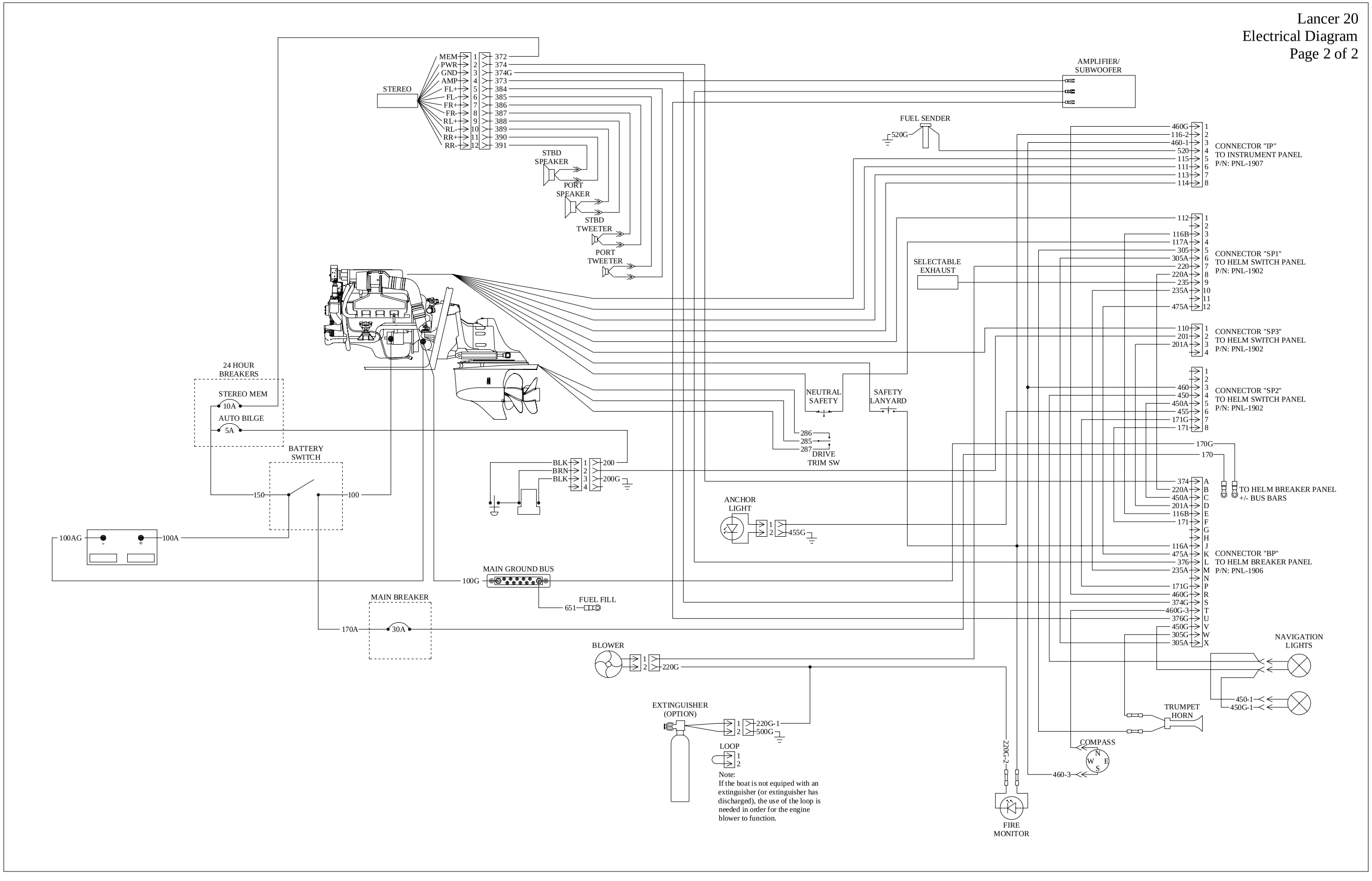


Figure 55. Lancer 20 Electrical Schematic (Sheet 2 of 2)

Lancer 22
Electrical Diagram
Page 1 of 2

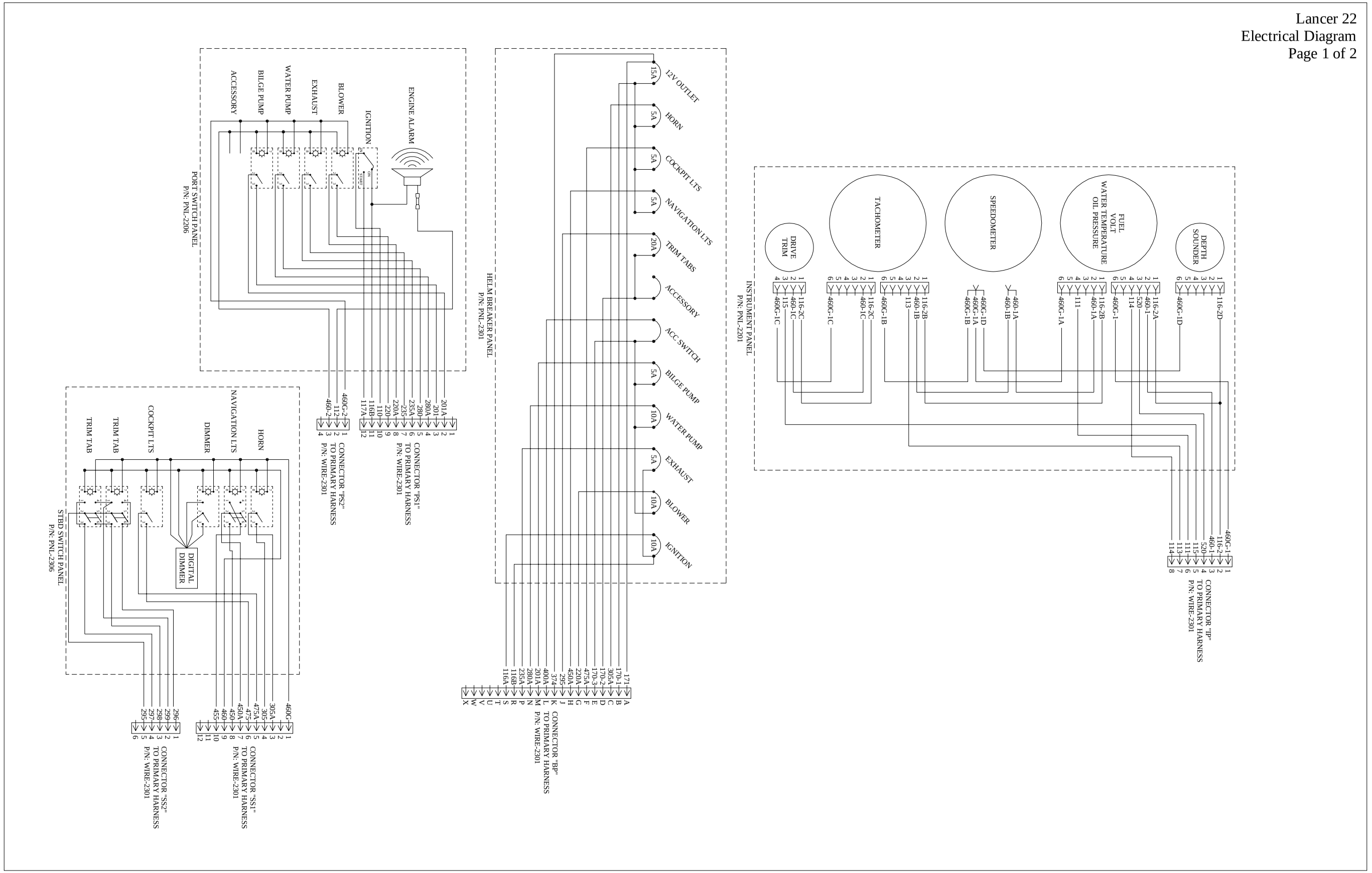


Figure 56. Lancer 22 Electrical Schematic (Sheet 1 of 2)

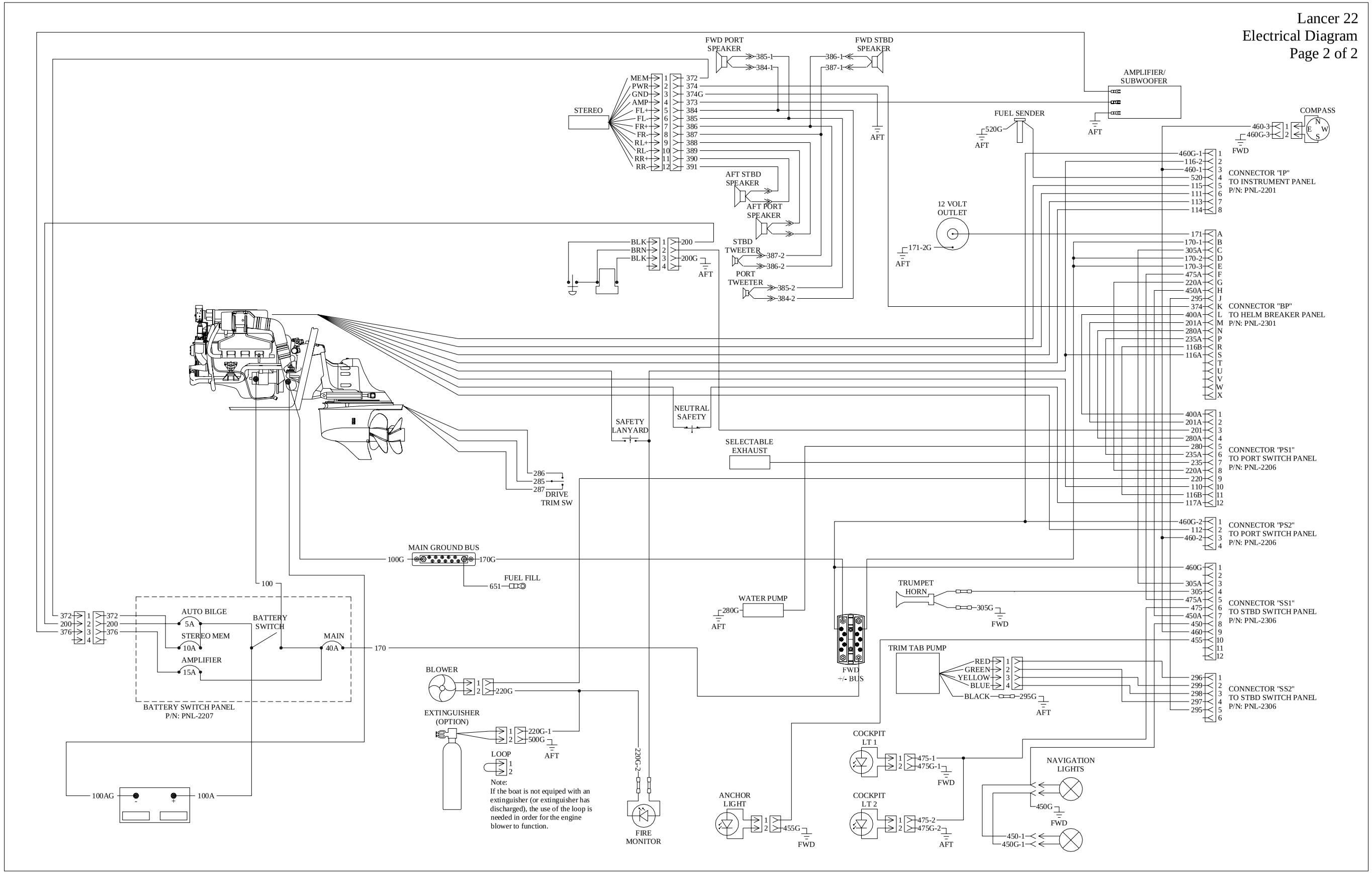


Figure 57. Lancer 22 Electrical Schematic (Sheet 2 of 2)

Launch 22
Electrical Diagram
Page 1 of 2

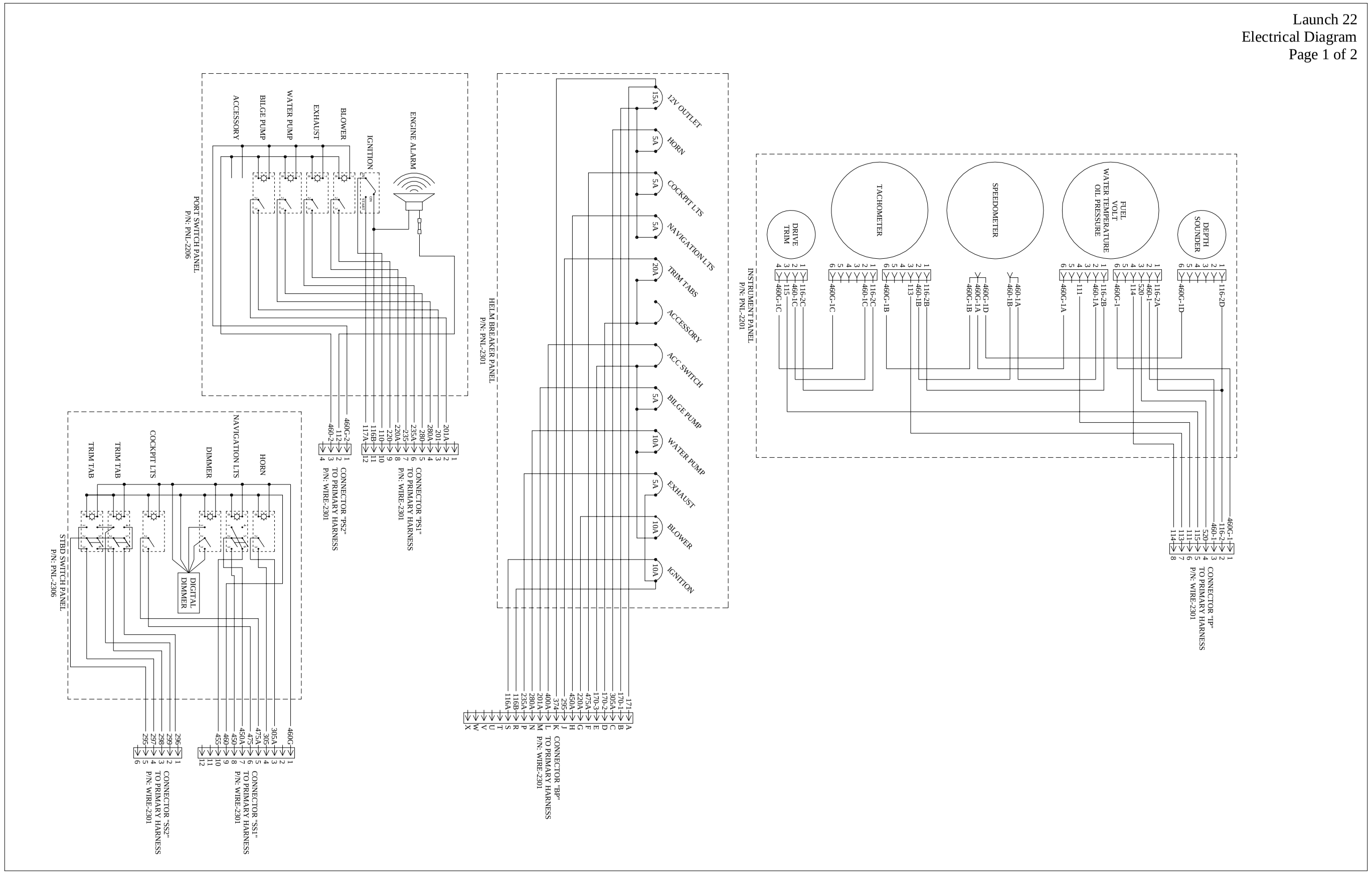


Figure 58. Launch 22 Electrical Schematic (Sheet 1 of 2)

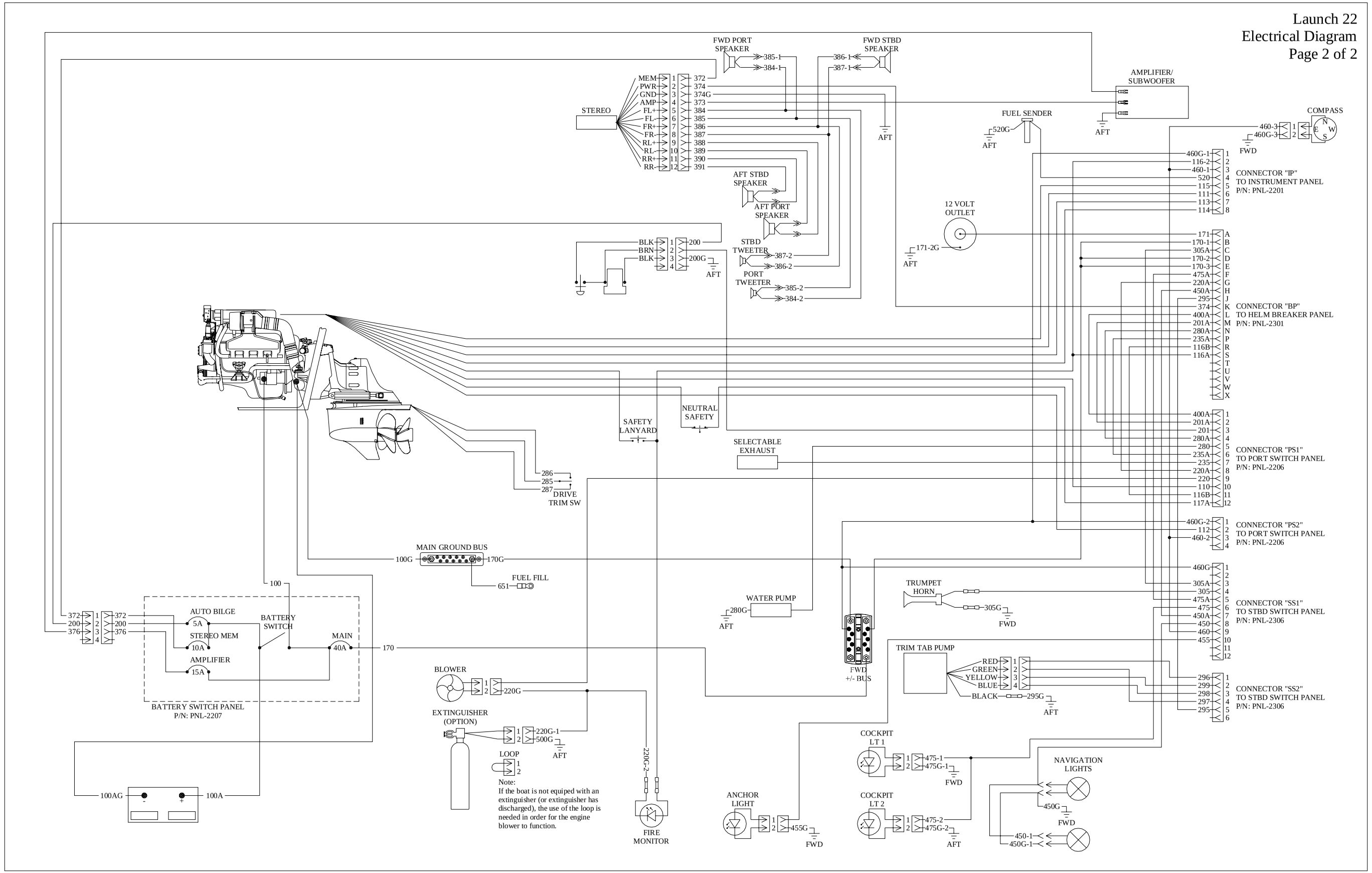


Figure 59. Launch 22 Electrical Schematic (Sheet 2 of 2)

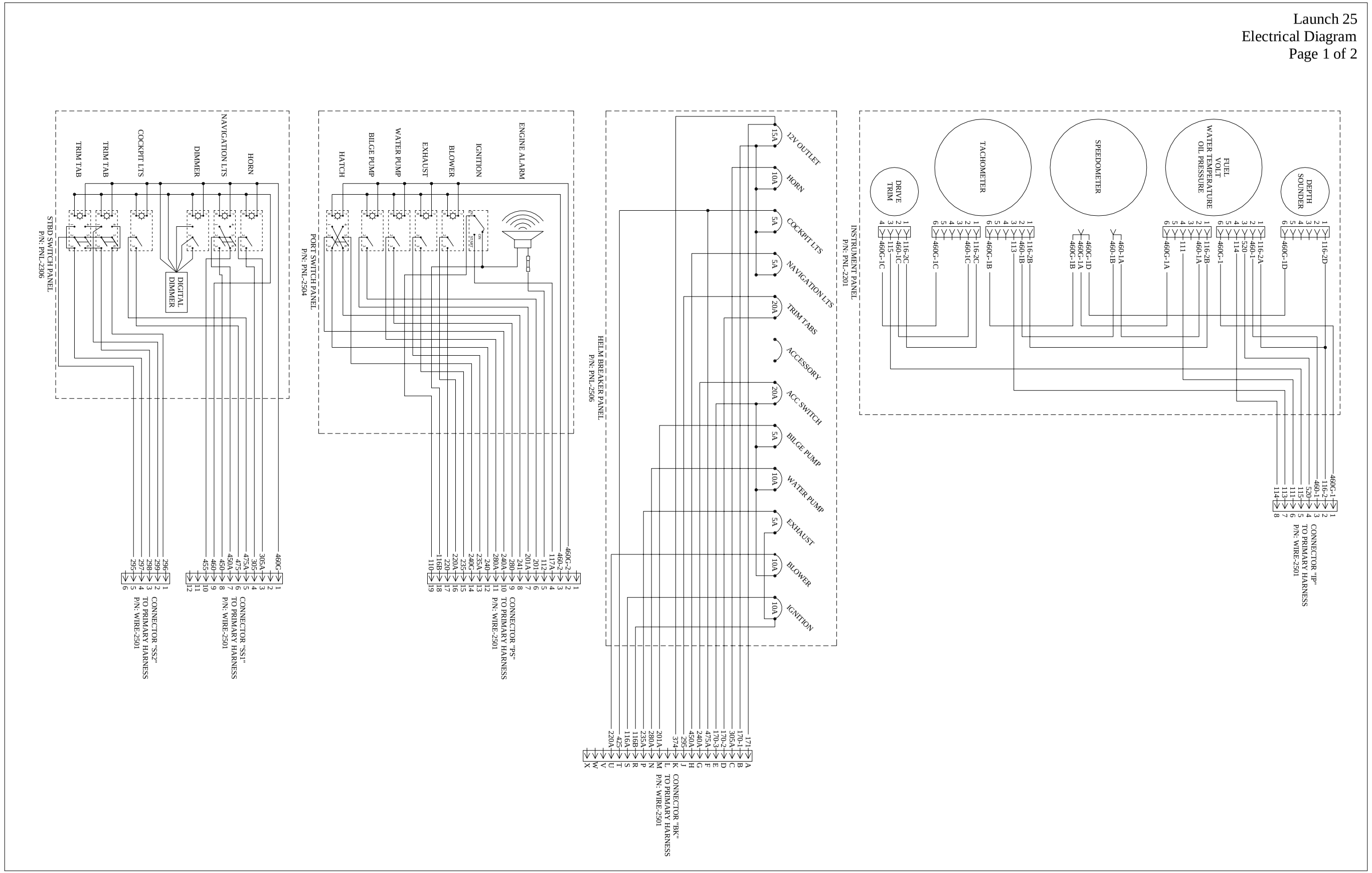


Figure 60. Launch 25 Electrical Schematic (Sheet 1 of2)

Launch 25
Electrical Diagram
Page 2 of 2

SELECTABLE EXHAUST
FUEL SENDER
520G
AFT
COMPASS
460-3
460G-3
460G-1
116-2
460-1
520
115
111
113
114
CONNECTOR "IP"
TO INSTRUMENT PANEL
P/N: PNL-2201
286
285
287
DRIVE TRIM SW
NEUTRAL SAFETY
SAFETY LANYARD
BLOWER
350G-2
ENGINE HATCH RAM
BLACK
WHITE
ENGINE HATCH RAM
BLACK
WHITE
20A
HATCH JUMPER
WATER PUMP
280G
AFT
460G-2
460-2
117A
112
201
201A
241
280
240A
280A
240
235A
240G
235
220A
220
116B
110
CONNECTOR "PS"
TO PORT SWITCH PANEL
P/N: PNL-2504
EXTINGUISHER (OPTION)
350G
500G
AFT
LOOP
Note:
If the boat is not equiped with an extinguisher (or extinguisher has discharged), the use of the loop is needed in order for the engine blower to function.
350G-1
116-3
FIRE MONITOR
TRUMPET HORN
305G
FWD
COCKPIT LT 3
475-3
475G-3
AFT
COCKPIT LT 4
475-4
475G-4
AFT
COCKPIT LT 1
475-1
475G-1
FWD
COCKPIT LT 2
475-2
475G-2
AFT
NAVIGATION LIGHTS
450G
FWD
450-1
450G-1
ANCHOR LIGHT
455G
AFT
12 VOLT OUTLET 3
171-3
171-3G
AFT
12 VOLT OUTLET 2
171-2
171-2G
AFT
TRIM TAB PUMP
RED
GREEN
YELLOW
BLUE
BLACK
295G
AFT
171G-1
171-1
305A
305
475A
475
450A
450
460
455
CONNECTOR "SS1"
TO STBD SWITCH PANEL
P/N: PNL-2205
296
299
298
297
295
CONNECTOR "SS2"
TO STBD SWITCH PANEL
P/N: PNL-2205
100AG
ENGINE BATTERY
100A
372
200
230
376
BRN
BLK
230G
AFT
SUMP PUMP
100
AUTO BILGE
5A
STEREO MEM
10A
CHARGER 1
20A
CHARGER 2
20A
BATTERY SWITCH
BAT
COM
BAT
MAIN
40A
170
AMPLIFIER
15A
FRIDGE
5A
SUMP
5A
SPARE
BATTERY SWITCH PANEL
P/N: PNL-2604
REFRIGERATOR
560
RED
560G
BLACK
AFT
HOUSE BATTERY
175A
175AG
SHORE INLET
815
BATTERY CHARGER
121
122
120G
AFT
AFT GROUND BUS
100G
170G
POWER AND GROUND
TO FWD +/- BUS
FUEL FILL
651
STEREO
MEM
PWR
GND
AMP
FL+
FL-
FR+
FR-
RL+
RL-
RR+
RR-
372
374
374G
373
384
385
386
387
388
389
390
391
PORT TWEETER
385-2
384-2
STBD TWEETER
386-2
387-2
AMPLIFIER/ SUBWOOFER
376G
AFT
AFT
200
200G
AFT
BLK
BRN
BLK
BILGE PUMP & FLOAT SW
AFT STBD SPEAKER
AFT PORT SPEAKER
FWD STBD SPEAKER
387-1A
386-1A
387-1
386-1
FWD PORT SPEAKER
385-1A
384-1A
385-1
384-1
HEAD LIGHT
425G
AFT
FWD
+/- BUS
171
170-1
305A
170-2
170-3
475A
240A
450A
295
374
201A
280A
235A
116B
116A
425
220A
CONNECTOR "BK"
TO HELM BREAKER PANEL
P/N: PNL-2506

Figure 61. Launch 25 Electrical Schematic (Sheet 2 of2)

Corsair 25
Electrical Diagram
Page 1 of 3

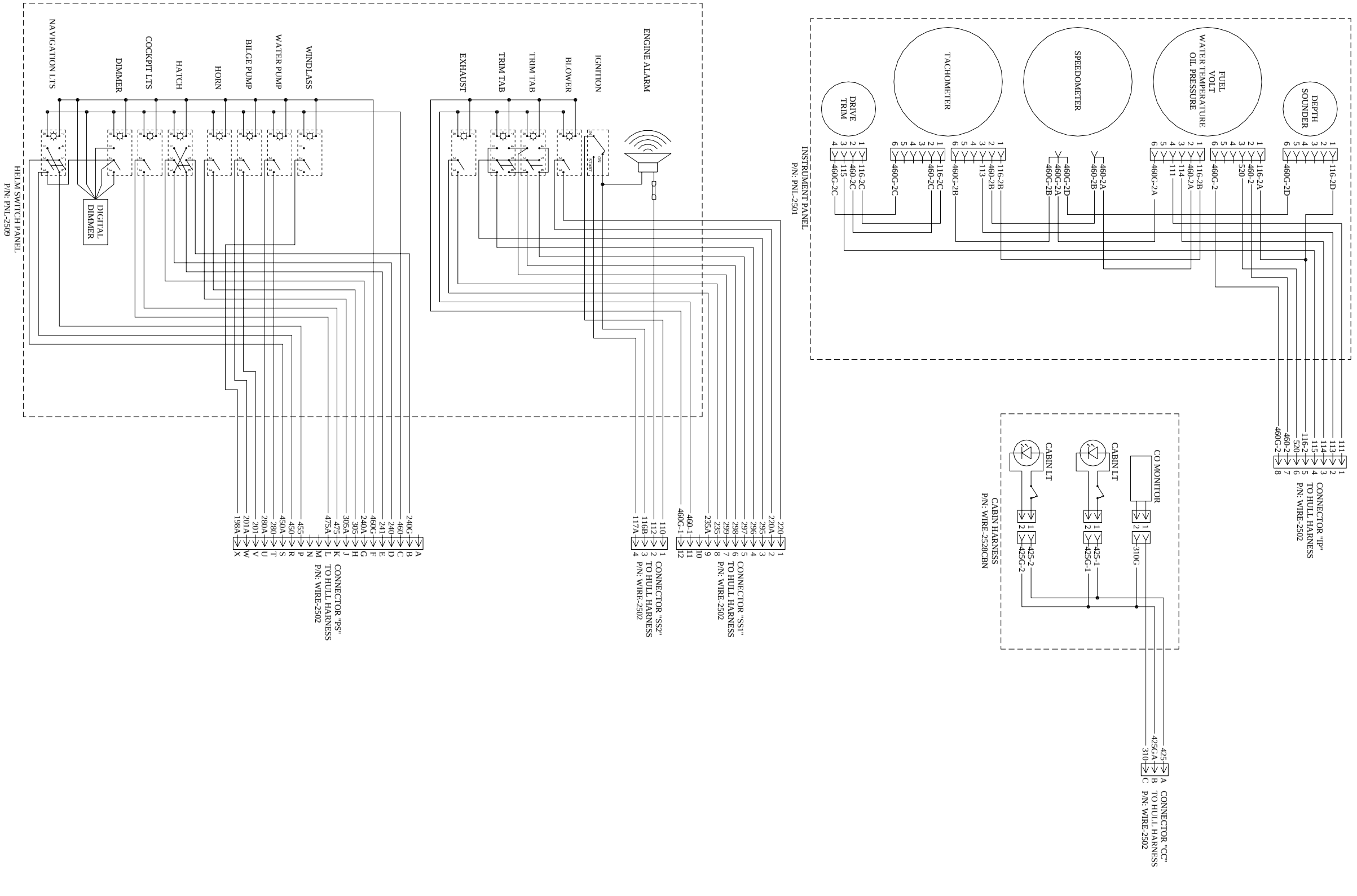


Figure 62. Corsair 25 Electrical Schematic (Sheet 1 of 3)

Corsair 25
Electrical Diagram
Page 2 of 3

CONNECTOR "CC"
TO CABIN HARNESS
P/N: WIRE-2528CBN
425GA
AFT
BATTERY CHARGER
121
122
120G
120AG
AFT
AFT
SHORE INLET
815
ENGINE HATCH RAM
BLACK
WHITE
240-1
241-1
ENGINE HATCH RAM
BLACK
WHITE
20A
HATCH JUMPER
FUEL SENDER
520G
AFT
TRIM TAB PUMP
RED
GREEN
YELLOW
BLUE
BLACK
295G
AFT
COCKPIT LT 1
475-1
475G-1
AFT
COCKPIT LT 2
475-2
475G-2
AFT
COCKPIT LT 3
475-3
475G-3
AFT
TRUMPET HORN
305G
AFT
ANCHOR LIGHT
455G
AFT
NAVIGATION LIGHTS
450-1
450G-1
450G
AFT
WATER PUMP
280G
AFT
FWD PORT SPEAKER
385-1
384-1
FWD STBD SPEAKER
386-1
387-1
AMPLIFIER/ SUBWOOFER
AFT
BILGE PUMP & FLOAT SWITCH
BLK
BRN
BLK
200
200G
AFT
STEREO
MEM
PWR
GND
AMP
FL+
FL-
FR+
FR-
RL+
RL-
RR+
RR-
372
374
374G
373
384
385
386
387
388
389
390
391
AFT
AFT STBD SPEAKER
AFT PORT SPEAKER
STBD TWEETER
387-2
386-2
PORT TWEETER
385-2
384-2
REFRIGERATOR
RED
560G
BLACK
SELECTABLE EXHAUST
NEUTRAL SAFETY
DRIVE TRIM SW
286
285
287
ENGINE BATTERY
100A
100AG
100G
HOUSE BATTERY
175A
175AG
FUEL FILL
651
AFT GROUND BUS
170G
170
POWER AND GROUND TO HELM BREAKER PANEL P/N: PNL-2510
BLOWER
350G-2
EXTINGUISHER (OPTION)
350G
500G
AFT
LOOP
Note:
If the boat is not equiped with an extinguisher (or extinguisher has discharged), the use of the loop is needed in order for the engine blower to function.
SAFETY LANYARD
COMPASS
N
W
E
S
460-3
350G-1
116-3
FIRE MONITOR
12V OUTLET
BATTERY SWITCH PANEL
P/N: PNL-2511
372
200
310
376
560
AUTO BILGE
5A
STEREO MEM
10A
CHARGER 1
15A
CHARGER 2
15A
BATTERY SWITCH
COM
B1
B2
MAIN
40A
AMPLIFIER
15A
FRIDGE
5A

CONNECTOR "IP" TO INSTRUMENT PANEL P/N: PNL-2501
111 113 114 115 116-2 520 460-2 460G-2

CONNECTOR "SS1" TO HELM SWITCH PANEL P/N: PNL-2509
220 220A 295 296 297 298 299 235 235A 460-1 460G-1

CONNECTOR "SS2" TO HELM SWITCH PANEL P/N: PNL-2509
110 112 116B 117A

CONNECTOR "PS" TO HELM SWITCH PANEL P/N: PNL-2509
240G 460 240 241 460G 240A 305 305A 475 475A 455 450 450A 280 280A 201 201A 198A

CONNECTOR "BK" TO HELM BREAKER PANEL P/N: PNL-2510
460G 240A 460G-1 201A 280A 460G-2 240G 460G-3 198A 374 425 235A 475A 116A 305A 171G 295 171 450A 116B 220A

Figure 63. Corsair 25 Electrical Schematic (Sheet 2 of 3)

Corsair 25
Electrical Diagram
Page 3 of 3

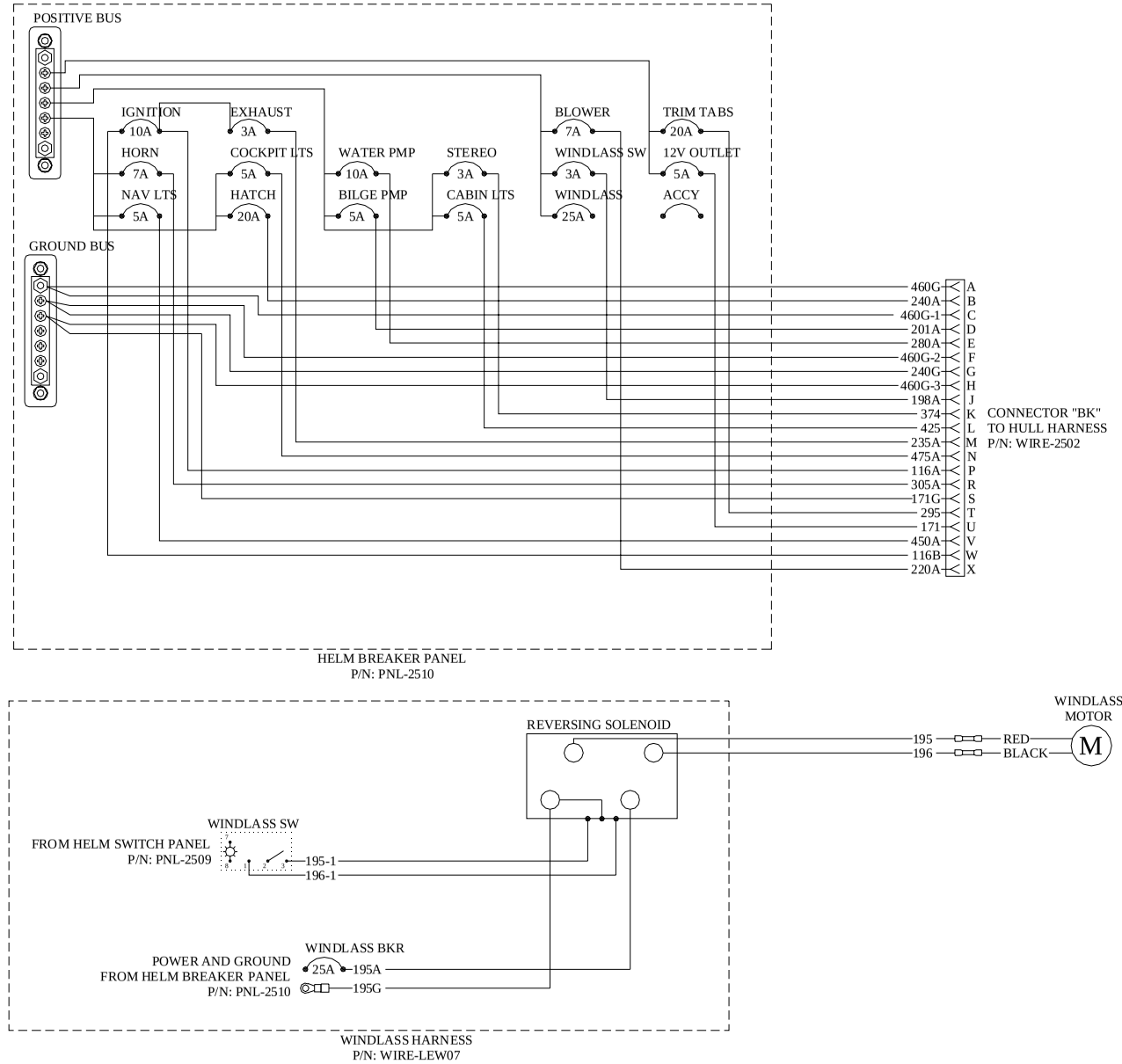


Figure 64. Corsair 25 Electrical Schematic (Sheet 3 of 3)

Launch 28/Corsair 28 - Single Engine
Electrical Diagram
Page 1 of 3

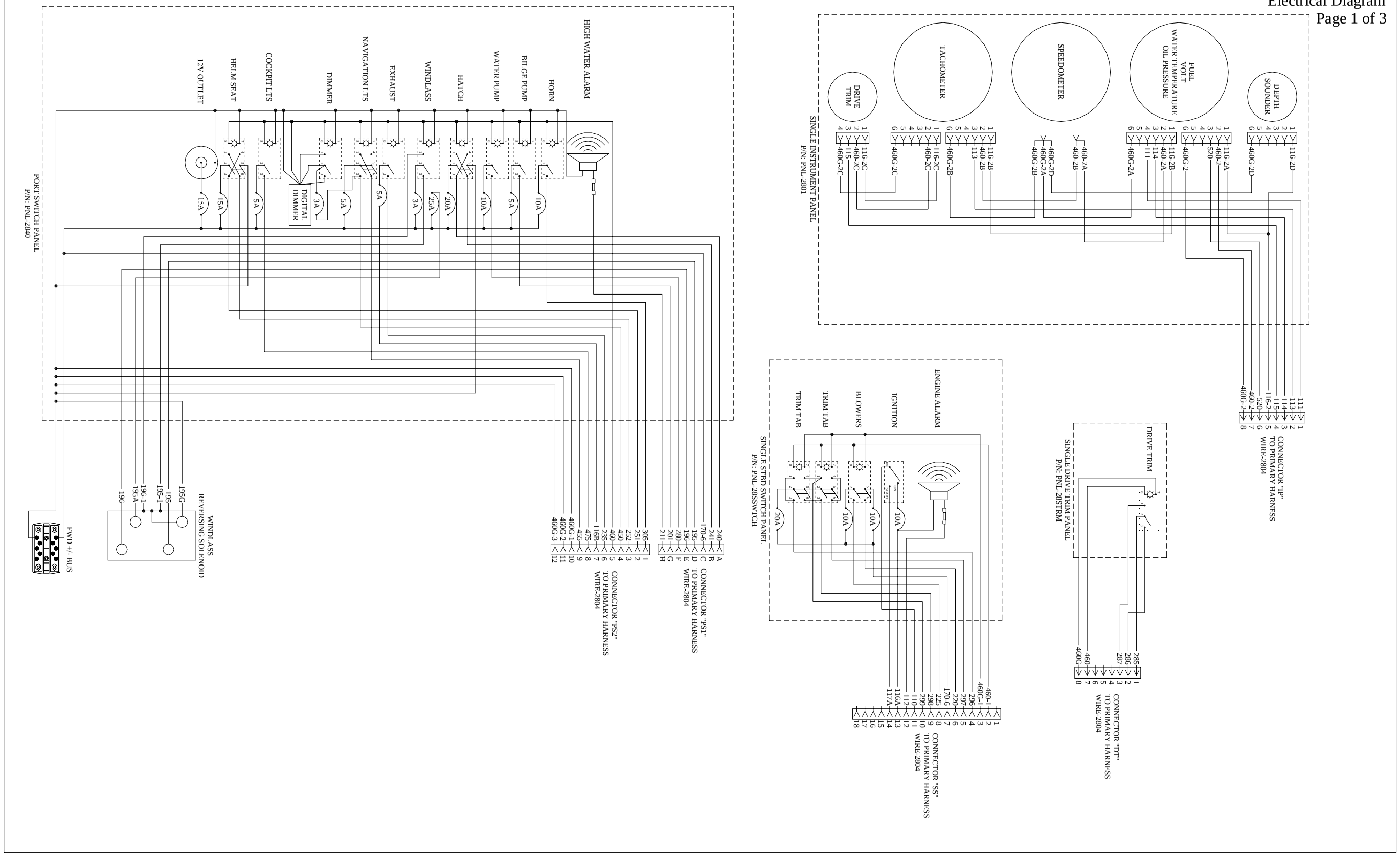


Figure 65. Launch 28/Corsair 28 Single Engine Electrical Schematic (Sheet 1 of 3)

Launch 28/Corsair 28 - Single Engine
Electrical Diagram
Page 2 of 3

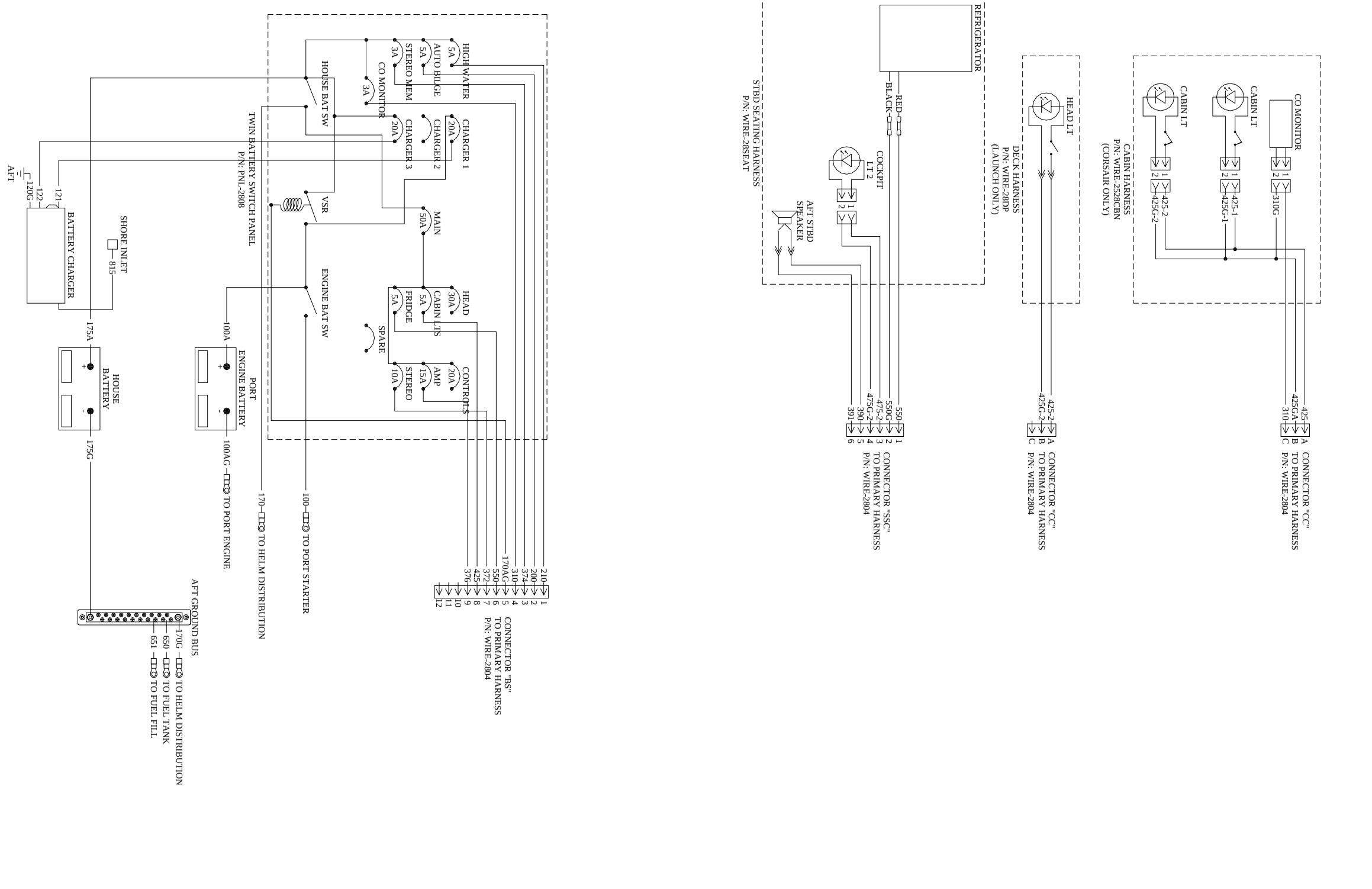


Figure 66. Launch 28/Corsair 28 Single Engine Electrical Schematic (Sheet 2 of 3)

Launch 28/Corsair 28 - Single Engine
Electrical Diagram
Page 3 of 3

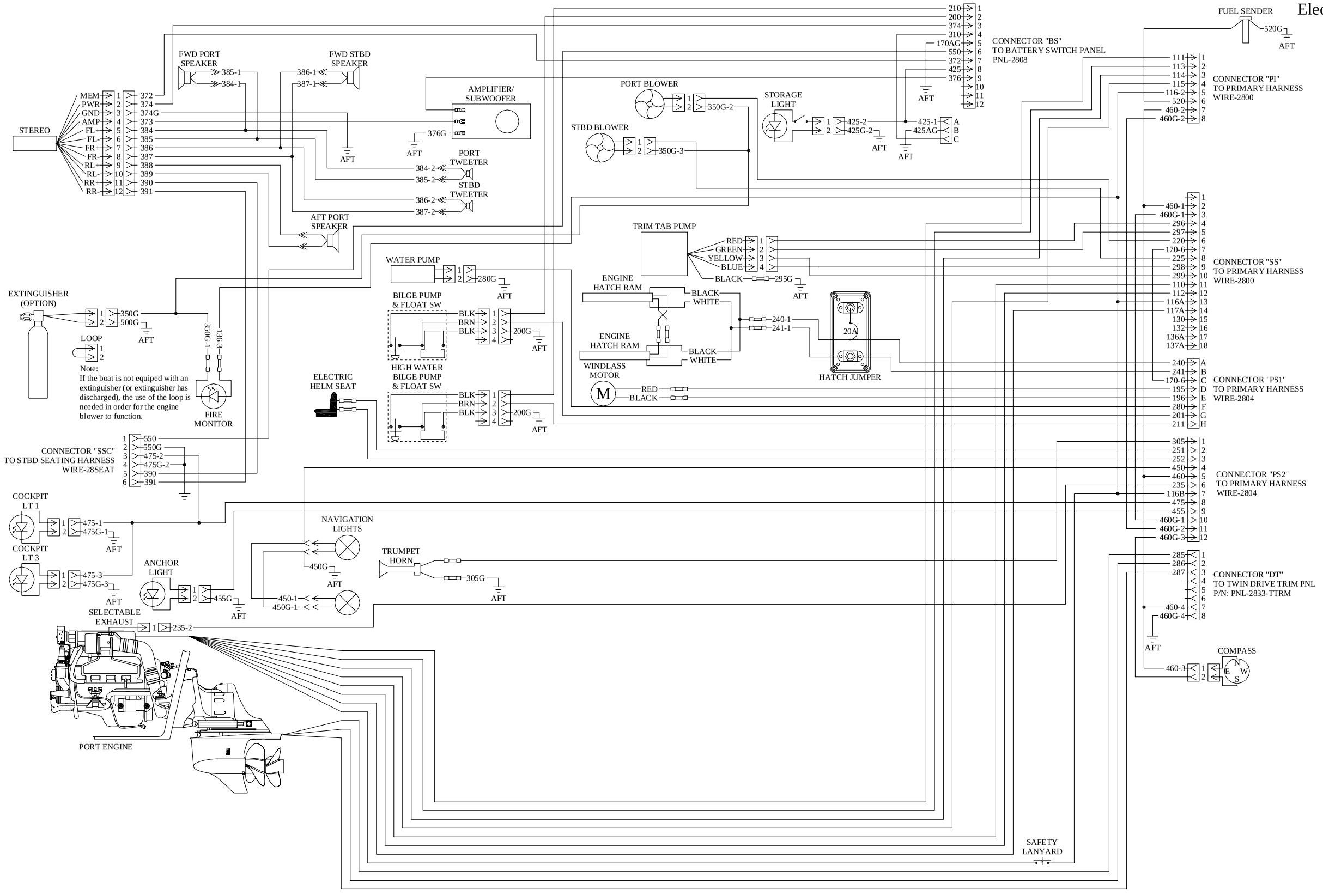


Figure 67. Launch 28/Corsair 28 Single Engine Electrical Schematic (Sheet 3 of 3)

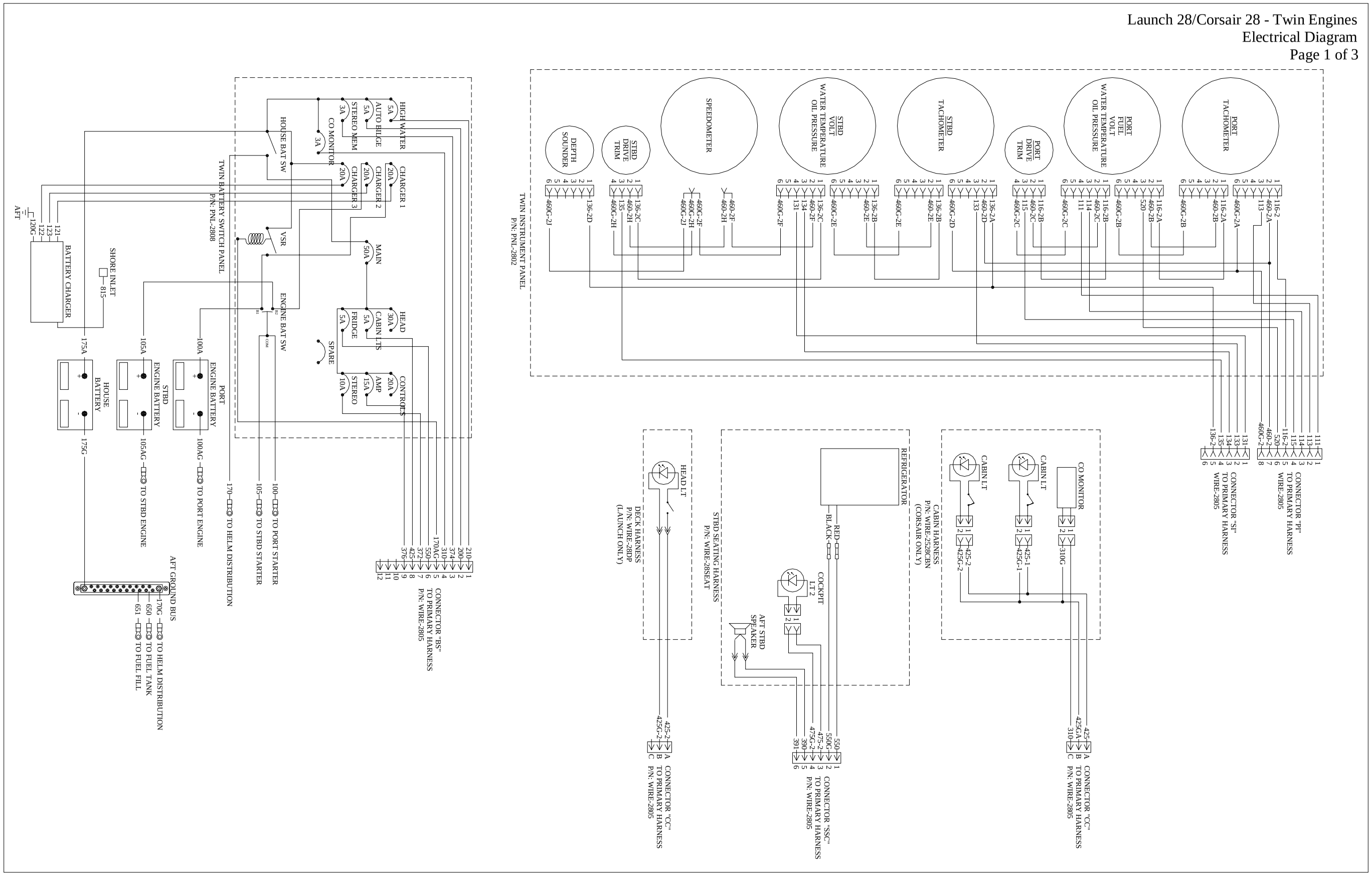


Figure 68. Launch 28/Corsair 28 Twin Engine Electrical Schematic (Sheet 1 of 3)

Launch 28/Corsair 28 - Twin Engines
Electrical Diagram
Page 2 of 3

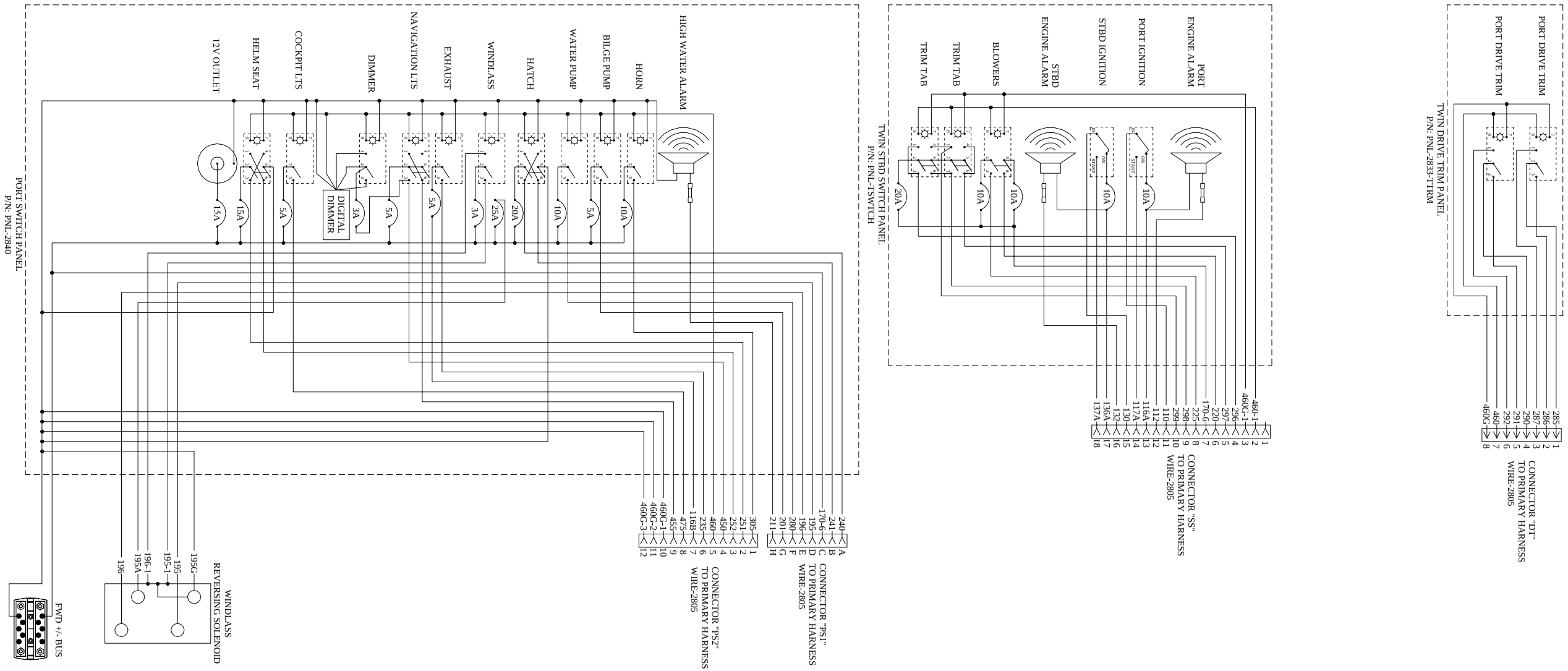


Figure 69. Launch 28/Corsair 28 Twin Engine Electrical Schematic (Sheet 2 of 3)

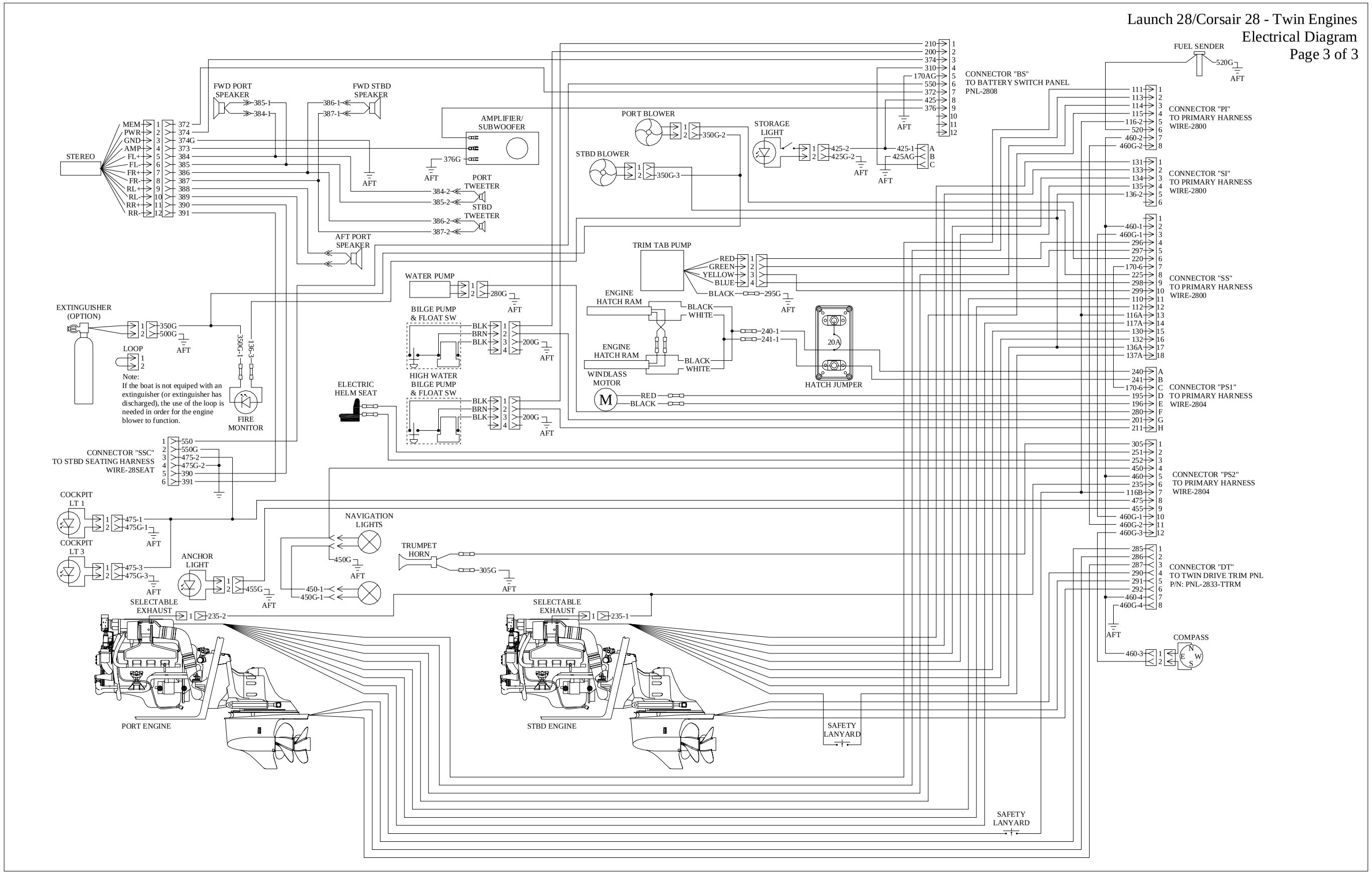


Figure 70. Launch 28/Corsair 28 Twin Engine Electrical Schematic (Sheet 3 of 3)